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COMPUTERWORLD

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Standard fare
Interview with Edward H. Sussenguth, former chief architect of SNA/8

Fast fade
IBM squelches PC2 rumors/37

Why goodbye?
John Cunningham looks back at Wang, ahead to CCI/71

Phone company readies high-speed ISDN trial

By Bob Wallace
Special to CW

New York Telephone Co. is planning to field-test an Integrated Services Digital Network that will use an interface different from the type used by most other former Bell operating companies.

New York Telephone's field trial will support the CCITT Primary Rate Interface. Pacific Northwest Bell, Mountain Bell, Illinois Bell and Southern Bell Telephone and Telegraph Co. are all planning ISDN tests supporting the CCITT's Basic Access Interface.

New York Telephone, however, is not the only former Bell operating company planning to support this interface. A spokesman for Bell Communications Research, Inc. in Livingston, N.J., said other telephone companies have plans to support the Primary Rate Interface, but be would not reveal their identities.

AT&T Communications — which has announced plans-to offer ISDN capabilities to its customers by 1987 — will support the Primary Rate Interface. The company, however, has not announced support of the Basic Access Interface, a difference that might encourage users to bypass the local telephone companies.

The Primary Rate Interface specifies use of a 1.54M bit/sec. digital link that is subdivided into 24 channels that operate at 64K bit/sec. Voice, data or video can be carried on 23 of these channels, and the remaining channel is used to carry signaling information.

The Basic Access Interface scheme, also referred to as 2B+D, calls for a 144K

See ISDN page 42

Profits dive for most mini makers

By Peter Bartolik
CW Staff

Financial results reported by minicomputer manufacturers last week continued on a mostly downward trend, marked by greater than expected losses at Wang Laboratories, Inc. and Data General Corp.

Further demonstrating the downturn, Prime Computer, Inc. continued to buck the trend with respectable revenue growth but posted only a marginal increase in profits; Gould, Inc. said minicomputer sales were strong, but write-offs in the semiconductor business produced a loss of $126.8 million.

In a more specialized area, fault-tolerant mini vendor Stratus Computer, Inc. remained on its fast-growth track, while industry leader Tandem Computers, Inc. reported a slight revenue growth and a 74% drop in profits. In other areas, mainframe vendor Amdahl Corp. reported a slight upturn, and Storage Technology Corp. announced a 50% drop in sales from a year earlier.

■ **Wang.** Just a few days after founder An Wang resumed the title of president [see story page 71], the company reported a fourth-quarter loss, its first in 12 years, of $109 million, or 78 cents per share, compared with year-earlier profits of $73.7 million, or 52 cents per share. Compounding an 11% decline in revenue for the quarter were pretax charges of $137 million for the write-off of inventory accumulations and additional expenses relating to the recent termination of 1,600 employees [CW, June 10]. Revenue for the quarter declined to $635.2 million from $713.8 million a year earlier.

For the fiscal year, which began to sour in the second quarter, Wang reported a revenue increase of $2.35 billion, up 5% from

See FINANCES page 7

Apollo 68020-based units bow

By Tom Henkel
CW Staff

BOSTON — Apollo Computer, Inc., one of the first entrants into the now-crowded 32-bit engineering workstation market, last week upgraded its popular line with two models based on Motorola, Inc.'s 68020 microprocessor.

At the same time, Apollo introduced an open architecture concept that the company claims will enhance Apollo users' ability to access data in other vendors' systems. The architecture will provide Apollo users with a gateway to IBM's Systems Network Architecture and links to Digital Equipment Corp.'s VAX series superminicomputers and IBM Personal Computers.

The significance of the latter introduction is that users of Apollo's top-selling Domain product line — an estimated installed base of 734 end-user systems, largely used by architects and electrical engineers — now have direct access to the DEC and IBM machines. Previously, Domain users had to access other vendors' systems exclusively via Ethernet.

The workstations announced at last week's news conference are the monochrome DN330 and color DN560. The units incorporate Motorola's 12-MHz 68020 CPU, announced last year and recently released, thus making Apollo's one

See APOLLO page 6

TOP OF THE NEWS

Casting a vote for standards, the Federal Election Commission is seeking hardware and software standards in vote counting units following allegations that they lack security. **Page 2.**

■

IBM's intent to establish a network standards research center indicates the firm is serious about developing protocols for interconnectivity, analysts said. **Page 4.**

■

Alliant Computer launched two processors said to combine vector and scalar processing capabilities. **Page 10.**

■

The head of Encore Computer said that Multimax, the company's first system, will vault the firm into the ranks of major supermini vendors. **Page 11.**

■

Despite Honeywell's reliance on NEC-provided mainframes, Honeywell has not reduced its own mainframe technology commitment. **Page 23.**

New life for aging micros

By Edward Warner
CW Staff

Old personal computers never die — they just get new owners.

That motto could be emblazoned on Rich Reed's office wall. Reed, manager of office systems at Cigna Corp.'s employee benefits and health care division in Bloomfield, Conn., said that as the division's 400 IBM Personal Computers get older, they are likely to get passed down to new and less experienced users.

Like Reed, most corporate microcomputer managers contacted recently by *Computerworld* said they will keep their personal computers despite the toll that several years of steady use has taken on their machines. Their strategy was summed up by Alan Gross, president of the New York-based Microcomputer Managers Association: "Most corporations are redeploying and reusing [personal computers] in other areas" of their firms.

Such a strategy reflects a trade-off, according to analyst Chris Christiansen of the Yankee Group, a Boston research firm. While the IBM Personal Computer, the corporate computing mainstay, grows cheaper by the month, the price of repairs on an old Personal Computer remains the same or grows. It costs an average of $400, he said, just to repair one diskette drive, the part of the computer that is often the first to fail.

"You're beginning to look at a machine that is increasingly costly to service," Christiansen observed. "When you have an old car, is it worth it to replace the transmission?"

The answer is yes as far as such firms as Cigna — an insurer — Merrill Lynch,

See OLD page 4

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NEWSPAPER

FEC moves toward standards

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — The Federal Election Commission (FEC) next week is expected to take an important step toward establishing voluntary standards for hardware security and performance in computerized vote counting systems.

The action, mandated by the U.S. Congress, follows a series of lawsuits contesting elections and allegations that computerized vote counting systems lack adequate security control features, making them prone to failures and vote manipulation.

Last week, William Kimberly, deputy director of the national clearinghouse on election administration in the FEC, said in an interview that there is currently no uniform set of minimum performance criteria for computerized vote counting systems nationwide.

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> *'It's not true that a programmer can manipulate the system undetected. There are all sorts of security controls.'*
>
> — Jack Kemp
> Computer Election Systems, Inc.

Kimberly said that, despite efforts to educate state election officials on the technology of computerized vote counting, the level of technical understanding at the precinct level has created "horror" situations.

The FEC does not investigate allegations of vote tampering or fraud involving computerized vote counting, Kimberly said. "This is a very muddy issue. Without a full investigation [of charges], it is very difficult to allocate blame. It is seldom possible to fix what or [find] who is responsible except that management errors are usually the cause," Kimberly said.

However, the FEC official said security features in vote counting systems currently on the market, especially when referring to operating system software, are "clearly the areas most vulnerable to attack." Kimberly said local election boards are free to buy and use any kind of vote counting software.

While the FEC's project advisory committee of state election officials is likely to adopt next week the draft hardware standard for the vote counting systems, a similar standard for software is at least one year away from adoption. The FEC recently awarded an $80,000 contract to Granite Creek Technology, Inc. in Scotts Valley, Calif., to produce a draft software standard.

According to Kimberly, once a set of hardware and software standards has been established, state legislatures will have to rewrite state election laws to require that any vote counting system sold to election boards be certified as meeting the standards. Adopting the standards will be a voluntary move by state election officials.

Computer Election Systems, Inc. (CES) in Berkeley, Calif., the country's largest vendor of punched card vote counting systems, counted more than 35 million votes in 40 states in 1984 presidential and local elections. The company said the hardware standards "are pretty stringent" and will raise costs of its Counting Multiplexer System for local jurisdictions.

CES has been named in three election-related lawsuits in West Virginia, Florida and Indiana. It has also been implicated in other contested elections in recent years by losing candidates. The charges assert that the security control features on the company's Votomatic punched card system have malfunctioned, been compromised or been subject to management errors that caused inaccurate vote tallies to be recorded.

CES President Jack Kemp last week defended the security control features of the company's punched card system, technology that he said was introduced to the market orginally in 1964. Kemp refused to discuss the specific lawsuits and allegations raised against the company but defended the security features of his company's punched card voting system. "It's not true that a programmer can manipulate the system undetected. There are all sorts of security controls present at the precinct level that would not permit this to take place," he said.

The FEC's Kimberly said that the majority of problems arising in punched card voting systems lie in the software's inability to handle exceptions to normal ballot counting routines, such as counting crossover votes and rejecting invalidly cast ballots.

In Carroll County, Md., a defeated candidate for the school board, Wayne Cogswell, contested a 1984 vote count where a CES punched card system was used. County election officials denied any problems. But when a consultant took the punched card ballots cast in the election and ran them through a neighboring county's similar CES system, a 13,000-vote adjustment was made.

Carroll County election officials subsequently admitted that a test tape operating system supplied by CES was inadvertently used to count the votes, and the tape did not accurately register the specific contests then under way in the county.

Emily Johnston, the computer consultant hired by Cogswell, said last week that it is possible for a programmer to turn off the CES system at any point when it is counting votes, insert an additional program control card containing vote adjustment totals and then restart the machine. "The subsequent printout of the program will never show that a change has been made," Johnston said.

NEWS SUMMARY

Analysts say that IBM's plan for a network standards research center shows that the company is serious about its commitment to interconnect different makes of computers/4

DEC introduces the VAX Information Center/6

Edward H. Sussenguth, the principal architect of IBM's Systems Network Architecture, discusses the evolution of the standard/8

Unclear standards for the upper layers of the International Standards Organization's Open Systems Interconnect network reference model are a concern both for users and vendors/9

A fourth-generation language and DG Eclipse MV/10000 are assisting in the collection of pledges in the UK from the Live Aid concert for world hunger/10

Encore Computer's chief executive is optimistic that the Multimax system can vault his firm into the ranks of major supermini vendors/11

VDT legislation was struck down in Oregon after it was vetoed by Gov. Victor Atiyeh/13

An opinion poll at the 1985 National Computer Conference showed that users are looking for optical disk products, networks and personal computer management solutions/14

West Coast Update/12
World Digest/16
Calendar/16

EDITORIAL/18
SOFTWARE & SERVICES/23
MICROCOMPUTERS/37
COMMUNICATIONS/57
SYSTEMS & PERIPHERALS/65
COMPUTER INDUSTRY/71

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IBM research center: commitment to net standards

By John Dix
CW Staff

IBM's recently stated intent to establish a research center to study network standards indicates the firm is serious about working toward the ability to interconnect different makes of computers, analysts said.

The IBM research center, to be built in West Germany, will be used by IBM to experiment with portions of standards that are still ill defined, according to one analyst. The center will be open to members of European academic and nonprofit research organizations free of charge.

The company marked the announcement of the center by saying it will finish development by year end on network protocols that conform to the middle layers — four (transport) and five (session) — of the International Standards Organization's (ISO) Open Systems Interconnect (OSI) seven-layer network reference model.

IBM also reported that it will evaluate OSI layers six (presentation) and seven (application) and will develop products to these standards — based on business decisions — as these standards are ratified. Only the first five layers have been fully specified by the ISO.

Most analysts viewed the announcement as further evidence that IBM is serious about standards. "IBM is as advanced in OSI as any other vendor, if not more advanced," according to Harold Foltz, executive director of Omnicom, a company in Vienna, Va., that advises industry on the application of OSI standards.

But OSI is not a panacea, warned Dale Kutnick, an independent communications consultant in Wayland, Mass. "Many users are under the misconception that if IBM adopts OSI and [Digital Equipment Corp.] adopts OSI that they will be able to connect their equipment," Kutnick said. "It may make it a little easier for that to happen, but it's not automatic."

The Heidelberg, West Germany, research center, called the European Networking Center, will house IBM and non-IBM processing equipment. It will be the company's European focal point for research and experimentation on network standards — particularly for higher layer protocols — and will be available at no cost to academic and nonprofit research outfits. All project results will reportedly be published and shared with appropriate standards organizations.

> *'IBM is as advanced in OSI as any other vendor, if not more advanced.'*
>
> — Harold Foltz
> Omnicom

"People are particularly serious about OSI in Europe," according to Ken Thurber, president of Architecture Technologies, Corp., a local network consultancy.

Today, IBM is delivering products that support the lower three levels of OSI through conformance to X.25, a CCITT standard that, according to an IBM spokesman, has been incorporated into OSI.

IBM products that support X.25 include the 4331 Model 2/11, 4361 and 370 mainframes; the System/36 mid-range system; the Series/1 minicomputer; both the 3705 and 3725 front-end processors; and a number of terminals and terminal controllers, including the 3274.

By the end of 1985, the spokesman said, IBM will have completed work on software that will provide IBM 370 support for two layers above X.25 — the fourth or transport layer and the fifth or so-called session layer. These OSI layers have reached international standard status, the highest form obtainable, according to John Heafner, chief of the systems and network architect division of the National Bureau of Standards.

Experimenting with prototypes

The uppermost two layers of the network reference model, the presentation layer six and application layer seven, are not yet fully specified. Until they are, IBM will experiment with prototypes at the research center, a spokesman said. Because there are so many options at these higher layers, IBM will have to gauge the potential business for each application before adapting its programs to work with OSI, the spokesman said.

IBM will not, however, discount Systems Network Architecture (SNA). "In Europe, people are trying to build to OSI," Thurber said, "so IBM has to support both SNA — which it clearly views as its future — and OSI because of the size of the European market."

In the opinion of Foltz, "IBM will evolve to OSI at a fairly good pace. Whether it migrates SNA completely to OSI or whether it offers OSI as an alternative is yet to be seen."

SNA is not that different from OSI now, according to Kutnick. "By 1988, perhaps 1987, SNA will be an implementation of OSI," the consultant said.

But perhaps the most important thing to keep in mind, according to Kutnick, is that "OSI in no way ensures that networks will work together. Implementations of OSI will be very different. OSI is a skeleton. There is no software. The software is still related to the operating system of each vendor."

OLD

from page 1

Pierce, Fenner and Smith, Inc. and accountants Touche Ross & Co. are concerned. Apparently, only when it is irreparably broken do corporations throw away a personal computer. And only when overwhelmed by charity, or when the machine is bypassed by the current technology, do corporations give personal computers away.

First to be outmoded for corporate use was the Apple Computer, Inc. Apple II line, the machines that originally brought desktop computing to some offices. Several corporations, including Cigna, reported giving their Apple machines to charity when they replaced the units with IBM Personal Computers.

Joe Brophy, vice-president of data processing at Travelers Insurance Co. in Hartford, Conn., estimated that a number of Travelers' 9,000 Personal Computers are reaching the end of what he called the three-year life span of the machine's parts.

So far, though, most corporations are hanging on to their Personal Computers. At Cigna's Bloomfield division, for example, all of the Personal Computers ever purchased, including the first bought 3¼ years ago, are still in use, Reed reported.

The machines have held their ground, he said, because they are tough and need few repairs. Cigna employees, he joked, "are going to keep [the Personal Computers] going till they die." Until the Personal Computers wear out, that is.

Micros get organ transplant

Old Personal Computers also never die at Merrill Lynch's New York headquarters. But, they might get an organ transplant in the form of an add-in processor board. Such upgrade boards as the Orchid Technologies, Inc. PCturbo-186 replace the Personal Computer's Intel Corp. 8088 microprocessor with a faster and newer Intel chip like the 80186.

The boards might represent a cost-effective way to give power users more speed and power, but they are not without drawbacks, according to Carol Bass, Merrill Lynch's manager of the personal computer support center. The PCturbo-186, she said, has been proven to be cumbersome in tests at the support center.

One difficulty, she said, is that users must reboot such programs as Lotus Development Corp.'s Symphony integrated package when they want to switch from the standard 4.77-MHz speed to the 8-MHz speed of the board's Intel 80186 processor.

Bass said she has had to return four boards, all for faulty chips, and is turned off by the price of the boards, which retail at $895 for a base model with 128K bytes of memory.

'Two computers on one chassis'

In response, an Orchid product manager said the need to reboot some programs was to be expected because "what you've actually got is two computers on one chassis."

Merrill Lynch has not given away any Personal Computers, Bass said, but firms such as Travelers and Touche Ross have made donations of used personal computers.

Touche Ross, for example, has permitted its local offices to dispose of approximately 150 to 200 Apple Computer Apple II models in recent years, and some microcomputers have gone to charities, according to Jeff Knepper, director of advanced technology/taxation in the company's Washington, D.C., office.

Other working Apple IIs, he said, were sold to employees for personal use, a strategy that Travelers will soon take when it auctions off nearly 100 older Personal Computers to its employees in sealed bidding.

Tax deduction not a factor

Neither Knepper nor Travelers' Brophy cited the gain of a tax deduction as the main reason that their employers donated personal computers to charities. Brophy, in fact, said Travelers' was most interested in being a good corporate citizen.

The lack of interest in a tax write-off for their donations, though, may also come from the fact that, by the time the personal computer is ready to go to charity, it has already been heavily depreciated as a business expense, according to Woburn, Mass., attorney Edward Saltzberg.

In fact, he said, a business usually deducts 40% of the value of the personal computer in the first year of ownership alone. "You're inviting an audit if you're donating to charity and taking a full-value" write-off of the donation, he warned.

Charitable giving can make one popular, though. Brophy said he received about 6,000 letters requesting donations after an article mentioning Travelers' microcomputer donations appeared in a national computer magazine.

Brophy was quick to point out that he is not the person to whom requests for equipment should be mailed; Travelers operates its own charitable foundation for corporate giving.

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WHODUNIT

Sortland Yard warns against "Raffles-type sort programs."

Call (201) 568-9700.

Ask for Inspector SyncSort!

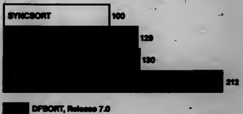
In an extraordinary move, Sortland Yard today warned data processors throughout the world to be on guard against what it termed "gentleman-bandit sort programs."

The warning was issued by one of the Yard's best known figures, Inspector SyncSort, who has sometimes been called "a legend in his own CPU time."

The inspector said, "One of the difficulties in apprehending these chaps is that they look so eminently respectable. They're members of a fine old hardware family. They've been to the right schools. And they invariably carry out their burglaries while wearing a dinner jacket from Savile Row."

EXPERT COMPUTER CRACKERS. "But once the party is underway," the inspector said, "these chaps head straight for the place where the family jewels are kept. They can crack open a computer and make off with a king's ransom in computer resources before you can say 'Hound of the Baskervilles.'"

To indicate "the true cost of this sort of misbehavior," the inspector released the following crime statistics:



SOMETIMES TAKE HOSTAGES. The inspector noted that these black-sheep programs often "take a dreadful toll" of programmers. "They are often tied up for days on end and forced to perform unnecessary coding, compiling and debugging. And they are heartlessly deprived of the labor-saving features that are taken for granted in most parts of the civilized sorting world."

Among these the inspector listed:

- **SORTWRITER**
- **MULTIPLE OUTPUT**
- **RECORD EDITING**
- **FAST FILE COPY**
- **MAXSORT**

TELEPHONE BEST DEFENSE. The inspector urged data processors to call the Yard immediately if they suspect their center is infested by a Raffles-type sort program. "The number is (201) 568-9700. We'll send over one of our highly trained sort detectives to track the culprit down."

Questioned as to what would be done with sort programs caught burglarizing computer centers, the inspector replied. "They will be given a just and speedy trial. If found guilty, they will immediately be transported to Iran!"

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DEC builds Information Center from existing products

Analysts question system's ability to offer total solution

By Eric Bender
CW Staff

MARLBORO, Mass. — Digital Equipment Corp. last week rolled out the VAX Information Center, described as a portfolio of existing VAX products and services designed to support end users.

According to Rose Ann Giordano, DEC vice-president of large systems marketing, the offering is "a significant repackaging" of DEC hardware, software, communications and service products.

Based on VAXs, Decnet networking products and decision-support software, the VAX Information Center reportedly was designed to help MIS departments facilitate end-user computing while maintaining the integrity and control of the corporate data base.

The VAX Information Center can be run on VAX products ranging from the VAX/750 to an 8600 cluster or networked VAXs, according to DEC. The center reportedly can be centralized or distributed to multiple locations.

Components include the VAX Toolbox, with integrated software tools such as All-In-One, Datatrieve and Decgraph; personal computer interconnection products; Decnet-to-IBM Systems Network Architecture products; videotex systems; consulting services, training and seminars.

Third-party software products such as SPSS, Inc.'s SPSS-X statistical package and Evaluation and Planning Systems, Inc.'s FCS-EPS financial modeling package also may be integrated within the information center, according to DEC.

The VAX Information Center is one example of DEC's "increased thrust in commercial data processing," Giordano said. "With a business user, you have to make the computer a lot easier to use.

"Personal computer users are one of the main reasons for an information center; they've often exhausted the potential of what they can do with the computer without having access to corporate data," she added.

"IBM coined the term information center, but we invented the concept," according to Giordano. "We've always had the idea of putting computer power as close to the user as possible."

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> *'IBM coined the term information center, but [DEC] invented the concept. [DEC's] always had the idea of putting computer power as close to the user as possible.'*
>
> — Rose Ann Giordano
> Digital Equipment Corp.

Steps untaken

While the announcement is a logical move for DEC, it leaves some steps untaken on the road to a complete IBM-style information center, industry analysts commented.

"The information center has proved a very successful market for IBM, so why shouldn't DEC try it?" asked Steven Smith of Paine Webber, Inc. in New York. However, "I certainly don't see it as a big market for DEC," he said. The corporate data sought by end users is typically on an IBM mainframe, and the VAX Information Center does not provide new tools that ease the task of getting at that data, Smith noted.

"It doesn't really show a strategy for the information center," commented Peter Lowber of the Yankee Group in Boston.

"Whether at the mainframe or the departmental level, an information center has got to be [IBM] DB2 and SQL compatible. . . . I don't see DEC with a [VAX] 8600 cluster competing with IBM," Lowber said.

The VAX Information Center will be on display at the Information Center Conference and Exposition in Nashville, Aug. 18-22, according to the company.

Further information on the VAX Information Center is available from DEC, which is located in Maynard, Mass. 01754.

APOLLO

from page 1

of the first systems to incorporate the microprocessor. The Apollo workstations, which also incorporate a Motorola 68881 floating-point processor, are said to provide two to three times the internal performance of Apollo's Motorola 68010-based workstations, first introduced in 1980.

An Apollo spokesman told *Computerworld* that the company will continue to produce its entry-level 68010-based DN300 workstation but conceded the current 68010-based DN550 color workstation will probably be phased out. However, current users of 68010-based Apollo workstations can upgrade their systems to the 68020 models in the field. A company spokesman said the upgrades cost between $7,500 and $10,500.

The DN300 with 2M bytes of main memory, 17-in. 1,024- by 800-pixel bit-mapped display, two RS-232C serial ports, emulators for DEC VT100-type terminals and other basic prerequisites costs $15,900. The same unit with a 70M-byte removable media disk drive and mouse costs $26,800. The DN560 with 2M bytes of main memory, 1M byte of display memory, 19-in. 1,024- by 800-pixel bit-mapped display and basic prerequisites costs $35,500. The same system configured with a mouse and 86M-byte 5¼-in. removable media disk drive costs $46,400. Both will be available in September.

Apollo also incorporated the 68020 into a server processor called the DSP90. The workstation is also said to be two to three times more powerful than the DSP80A server processor, which uses a 68010. The DSP90 with 2M bytes of main memory, 64M-byte virtual address space, two asynchronous I/O ports and a network interface costs $18,000. It will also be available in September, the company said.

In announcing the 68020-based products, Apollo also lowered the purchase price of its top-end DN460 and DN680 workstations by up to 27%. It also cut its prices for main memory on the entire Apollo line to $3,000/1M byte. A monochromatic DN460 with 4M bytes of main memory, which used to cost $53,500, now costs $39,500. A color DN 680 with 4M bytes of main memory, which previously sold for $65,500, now costs $49,500, the company said.

The company also unveiled the MSD-86M-86M and the slave Add-86M disk drives for its mid-range DN550 and DN560 color systems. The 5¼-in. Winchester drives offer 86M bytes of storage. The MSD-86M-86M costs $12,500 and the Add-86M costs $4,500.

For additional information, Apollo is located at 330 Billerica Road, Chelmsford, Mass. 01824.

Apollo [illegible]

[illegible]

FINANCES

from page 1

$2.18 billion the previous year, when it appeared that the company was well on its way toward the $3 billion mark.

The sudden reversal of Wang's seemingly inviolable 30% growth rate resulted in fiscal 1985 profits tumbling to $15.5 million, or 11 cents per share, compared with profits of $210.2 million, or $1.52 per share for the previous year.

An Wang, in a prepared statement, said the company's business plan had proved too aggressive in light of the rapid slowdown in demand and that cost-cutting measures have repositioned the company to achieve profitable performance.

■ **DG.** The firm reported a third-quarter operating loss, its first ever, of $16 million, compared with operating profits of $28.6 million a year earlier.

Unlike Wang, DG was able to utilize tax credits to reduce the net loss to $8.3 million, or 32 cents per share, compared with year-earlier net profits of $18.6 million, or 71 cents per share.

> **99**
>
> ***The sudden reversal of Wang's seemingly inviolable 30% growth rate resulted in fiscal-year 1985 profits tumbling to $15.5 million, compared with 1984 profits of $210.2 million.***

One-time severance costs from the dismissal of 1,400 workers [CW, June 24] added $6.3 million to DG's quarterly expenses, and a write-down of inventory added $8.2 million.

Revenue for the quarter was $285.5 million, down 6% from a year earlier.

Edson D. de Castro, president of DG, said current business levels will produce a small profit or loss for the fourth quarter, and he said it is likely that some manufacturing operations will be shut down for up to two weeks in late August or early September.

■ **Prime.** After a contrarily strong first quarter that led the company, at its annual meeting earlier this year, to announce plans almost gleefully to hire 1,000 people, Prime said last week that it is curtailing discretionary expenses and that any nonsales hires will require approval by the board of directors.

The company reported that second-quarter revenue was $187.2 million, up 16% from $161.4 million a year earlier.

But profits showed only a "modest increase" to $13.1 million, or 27 cents per share, compared with year-earlier profits of $12.8 million, or 27 cents per share.

Prime President Joe M. Henson, however, said the company is pleased with its performance in light of the adverse reports from competitors.

■ **Gould.** This company reported that a previously announced write-off incurred by reducing its semiconductor operations amounted to $160 million, or $3.65 per share, and contributed to a second-quarter net loss of $126.6 million, or $2.87 per share. Excluding the write-off, the company had profits of $15.3 million, or 35 cents per share, compared with year-earlier profits of $22.8 million, or 50 cents per share.

The company said it has reduced expectations for the third quarter due to continued weakness for electronic components but added that its information systems products had performed strongly in the second quarter.

■ **Tandem.** The company reported revenue up slightly to $144.1 million, from $141.9 million a year earlier, while product sales declined by almost 2%.

Profits for the third quarter tumbled to $2.4 million, or 6 cents per share, from $9.3 million, or 23 cents per share a year earlier, as growth in expenses outpaced sales.

■ **Stratus.** In contrast, the challenger in the fault-tolerant arena reported second-quarter revenue was up 99% to $18.5 million, compared with $9.3 million a year earlier.

The company said OEM agreements with IBM and others contributed significantly to financial results, and quarterly profits were $1.9 million, or 10 cents per share, compared with year-earlier profits of $1.3 million, or 7 cents per share, which included a tax credit of $500,000.

■ **Amdahl.** This firm reported that second-quarter revenue was up almost 5% to $206.1 million, compared with $196.8 million a year earlier.

Profits were $5.1 million, or 11 cents per share, compared with year-earlier profits of $4.9 million, or 11 cents per share. The company said sales were up but not to the level of earlier expectations.

■ **STC.** The company, continuing reorganization under protection of Chapter 11 of the Federal Bankruptcy Act, posted a second-quarter loss of $15.9 million, or 46 cents per share, compared with a year-earlier loss of $4.8 million, or 14 cents per share.

The company said termination of a printer manufacturing facility in Palm Bay, Fla., contributed $3.5 million to the loss.

Sales revenue was almost halved to $84.1 million, from $161.4 million a year earlier, producing a slide in total revenue to $172.6 million, down 30% from year-earlier revenue of $247.1 million. The company said it had expected a greater loss than it reported.

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Edward H. Sussenguth

Chief architect of SNA

Edward H. Sussenguth headed up the IBM team that developed Systems Network Architecture (SNA) for the first 10 years of its existence. SNA, a de facto industry standard, is a strategic IBM product, central to the manufacturer's efforts to interconnect its product line. As the principal architect of SNA in its early days, Sussenguth has seen SNA evolve to accommodate changes in industry and technology. While at the National Computer Conference earlier this month, Sussenguth — now an IBM fellow — ruminated about the history of SNA and networking in general with Computerworld*'s senior editor of communications, John Dix.*

Why was SNA developed?
There were three reasons in the beginning, all roughly equal. One was we were basically in a mess at that time. We supported a large number of different protocols and access procedures. That was wrong, it was wrong for us, and it was wrong for our customers.

The second reason is technical. In the early 1970s, the revolution of distributed processing became reality. You could put a minicomputer in a bank, whereas before, you only had dumb devices out there. The way you communicate with a dumb device is different than the way you communicate computer to computer. So we had to change. We had to invent new things in order to communicate with these new kinds of gadgets.

We also foresaw [network] growth, although probably not the rapidity of growth that has happened in the last 10 years. It was clear that the networks were going to get bigger and bigger and [before SNA], there was no way that we would be able to support the customer.

We knew the technologies were changing rapidly . . . and what we really needed was some semblance of structure in order to try to handle that change. That was the reason behind the concept of the [layered network architectures]. When you change something on one layer, you don't have to change everything on either side of it. That's not unique to us.

Is there anything you missed in the development of SNA?
If we missed anything, it was probably network management. I think we didn't realize how significant network management was to our customers, which is probably related to growth [in the] size of networks. If we had it to do over again, we probably would have done network management sooner but not necessarily better. But we've had to really catch up.

There has been a lot of criticism about the complexity of SNA.
Sure, SNA is complicated because it does a complicated thing. Chips are complicated — they do complicated things. The real question is, 'Is SNA overly complex for the level of function that it provides?' I don't believe so. I agree that as you look at it, it is complex, it's complicated. I don't think we have anybody who understands it all; I don't think we need to. As long as the pieces work together.

Do you think there will ever be a single networking standard?
Sure, it's in the best interest of customers to have standards. I can't plug my shaver in the wall in France. The thing that I think the standards community — and we who participate in it — have to be careful of is premature standardization. Premature standardization is likely to be worse than none at all.

I think the press does a disservice in giving people the impression that a standard is going to come about where I can prepare my document on processor X, transmit it to processor Y and then send it to processor Z to be handled. All of the editing commands and the data base [capabilities] that that entails are an awfully long time away.

Working our way gradually up the OSI [Open Systems Interconnect] model is the right thing for the industry to do, but one should be very careful about trying to be unreasonable about what can be expected.

Will SNA eventually be that standard?
No, I don't think so, I think IBM will continue on its own course with SNA, and other vendors will continue to develop their own internal architectures. At the same time, we will try to be sure that we match the international and national [standards].

Do you have any general prognostications about how networking might eventually take shape in the future?
The single-word answer to that is size. It seems fairly apparent that someday, we are going to get to the point where consumers have terminals. Maybe it will get as far as videotex and other things associated with home television sets; maybe it won't get that far.

When you start thinking about home banking, using your [personal computer] or your TV set, the network could be enormous, reflecting back on technical attributes like reliability and availability. [It would also require] more sophisticated mechanisms inside of the network like directory management, [finding out] where you are, [finding out if] you are eligible to receive this information.

Future networking will be end-user driven then?
I don't know how fast it is going to get to the real consumer, but it is already happening rapidly in the office. In Japan, Western Europe, the U.S. and Canada, we'll soon get to the point where there is a terminal for every two workers.

How close are we to that now?
Obviously, in this case, the cobbler's son has shoes. In IBM I would guess that we are approaching at least one terminal for every two workers today, if not one to one. Banking and insurance industries should approach that ratio.

I heard that PC Network came out of the Entry Systems Division in Florida with little or no interaction with the SNA folks in Raleigh, [N.C.].
IBM has separate business units that make decisions based on their general businesses. The chairman does not go up and shoot somebody if they come out with non-SNA-compatible products. We have guidelines where we try to tell people, 'We would like you to do it this way.' The [personal computer] guys did their own networking, but they didn't do it completely unbeknownst to Raleigh. It was a decision that was tactically best for the [personal computer] at that time and was done in such a way that would not dead-end itself.

Is SNA a strategic product for IBM?
SNA is clearly a strategic direction. What we are

See SNA page 9

Undefined upper layers reduce OSI's usefulness

Market fragmentation said to confuse users

By Paul Korzeniowski
CW Staff

"Despite what some companies are claiming, users are only being provided with four-sevenths of a solution," according to a speaker at a session on networks at this month's National Computer Conference (NCC).

Although the lower layers — one through four — of the International Standards Organization's (ISO) Open Systems Interconnect (OSI) network reference model have been specified, unclear standards for the upper layers — five through seven — are a concern to vendors and end users, said Leonard Magneson, marketing manager for OEM products at Intel Corp.

> *'Whenever a user wants to run a session, the network should identify the resources that are needed and establish the data path.'*
>
> — Wendall Turner
> TRW, Inc.

Magneson's remarks came at a technical session at NCC, titled "Communication Software for LANs."

The marketing manager stated that the local-area network market is fragmented, riddled with many vendors and has users so confused that they are reluctant to purchase products.

Magneson noted that the OSI lower level standards supply useful interconnection capabilities. However, because the upper levels are still undefined, there is little opportunity to integrate data on a network, according to Magneson. "The upper level layers do not effectively use network resources and permit limited data sharing," he noted.

A number of different net types

Despite vendor claims, there must be compatible equipment across the network for data to be effectively shared, according to Magneson. "When it was first proposed, many people thought that there would only be one type of network. Instead there will be a number of different types of networks," he predicted.

Wendall Turner, chief protocol architect at TRW, Inc., defined ISO networks as having a 1- to 10-mile diameter, being owned and operated by a single company, providing point-to-point communication and being self-contained.

Turner noted that physical connections between ISO model devices have been established, but how data moves through a network is unclear. "Whenever a user wants to run a session, the network should identify the resources that are needed and establish the data path," he said.

The protocol architect listed two methods of achieving this goal. One method would have a central server that would supply the names and addresses of each file.

"The problem with this approach is that there is no backup if the central server fails and data at the server has to be updated constantly," Turner stated.

A second method would work with a distributed design. A major problem with this type of design is that not every session would be able to respond to it, he said.

SNA from page 8

trying to say with SNA is that we intend to use SNA as the main, but not only, vehicle for our set of communications products.

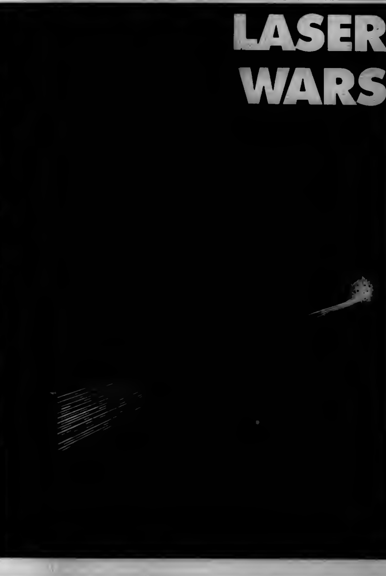
You said the chairman won't shoot product developers who don't embrace SNA. How does the process work?

Our job as architects is to try to anticipate the future needs of business and technology. As products near their announcement time, we have the opportunity to voice criticism of the product. If a product is to come out without SNA capability and the director of architecture thinks it should [support SNA], he would raise that to the executive in charge.

Turning from SNA, what are you involved with now as an IBM fellow?

As an IBM fellow, you have the opportunity to choose a project or projects of your liking and get a staff to assist you on it. I'm interested in high-speed communications. As you know today, telephone lines mostly communicate at 4.8K bit/sec., 9.6K bit/sec. or 56K bit/sec. In the U.S., Japan and some European countries, T1 speeds of 1.54M bit/sec. and 2.48M bit/sec. are starting to become prevelant.

In the future, when you begin to look at fibers, the numbers aren't one and two megabits; they're 100 and 200 megabits per second. . . . What in the world are we going to do with it and what does it do to our systems and what does it do the capabilities that computers can do for us? It is a fascinating business we are in, absolutely fascinating.



Alliant combines vector, scalar processing in releases

By Donna Raimondi
CW Staff

ACTON, Mass. — Alliant Computer Systems Corp. has launched two machines — an entry-level supercomputer and a superminicomputer — that combine both vector and scalar processing. The systems are geared toward the scientific and engineering fields.

The firm's FX/8 supercomputer is said to allow parallel processing, with up to eight processors working simultaneously on the same problem without programmer intervention. It is said to apply this parallel processing automatically to existing scientific and engineering software programs, including those that run on Digital Equipment Corp.'s VAX systems. The architecture bases the parallel processing control in dedicated hardware.

Each FX/8 CPU — which uses 8,000-gate Cmos gate arrays to implement a full scalar instruction set — also has an integrated vector instruction set, Institute of Electrical and Electronics Engineers, Inc. floating-point support, concurrency control and virtual memory management.

The company's FX/Fortran compiler is said to detect the potential for parallel and vector processing in standard Fortran programs. The C and Pascal languages are also supported by Alliant's Concentrix operating system.

The FX/8 — which costs from $270,000 to $1 million — starts with a base system that contains one CPU, 8M bytes of physical memory, one 64K-byte computational processor cache memory, one 32K-byte interactive processor cache memory, a 13-slot configurable Intel Corp. Multibus chassis, a 376M-byte Winchester-type disk, a tridensity start/stop tape drive, a 16-user Concentrix operating system license and an FX/Fortran license.

The system is reportedly expandable, without changes to existing software, to eight CPUs, which are called Computational Elements by the vendor; 12 I/O processors, called Interactive Processors by the vendor; 64M bytes of main memory; 128K bytes of I/O cache; and 128K bytes of cache memory.

In its highest expansion, the system is said to offer peak performance of 94 million floating-point operations per second (Mflops) or 35.6 million instructions per second. Running the Linpack benchmark from Argonne National Laboratories in full 64-bit precision, a fully configured FX/8 is said to deliver more than 12 times the performance of the DEC VAX 8600.

Concentrix, which is Alliant's implementation of the University of California at Berkeley 4.2 Unix operating system, is said to execute on the interactive processors while off-loading the computational complex for uninterrupted processing. The interactive processors handle all operating system tasks and device interrupts, freeing the computational complex for uninterrupted execution of compute-bound programs.

The system includes a diagnostic subset of Concentrix, called Diagnostix, which is said to support local and remote fault isolation and system configuration.

The Alliant FX/1 desk-high multiprocessing superminicomputer also incorporates vector processing, the company said. The system — which costs $132,000 — is said to be useful as a multiuser departmental system or as a computational server on a network of engineering workstations.

The FX/1 combines 8,000-gate Cmos gate arrays and vector processing to deliver peak performance of 11.8 Mflops. It includes a CPU to handle programs while the interactive processor executes user-intensive jobs, the operating system and all I/O, the vendor said.

The basic system includes one CPU, one I/O processor, 8M bytes of physical memory, a 32K-byte cache, a system floppy disk, a 67M-byte Winchester disk, a 5¼-in. cartridge tape drive, a six-slot Intel Multibus chassis, an 8-user Concentrix license and an FX/Fortran license. It can be expanded with an additional 8M bytes of main memory, one additional I/O processor and a full range of peripheral devices.

Both systems will be available in October.

Alliant is located at 42 Nagog Park, Acton, Mass. 01720.

Live Aid hunger fund profits from donated system's speed

By John Desmond
CW Staff

LONDON — The accountants for the Live Aid benefit concert for world hunger are being assisted in the quick collection of pledges — from some 130,000 donors in the UK — by a fourth-generation language and a Data General Corp. Eclipse MV/10000.

The computer system should allow the $5.5 million to $6.5 million in pledges in the UK to be charged to credit card accounts within a week, according to Bill Cadogan, region manager for Data General, Ltd. here. Estimates of worldwide pledges range up to $70 million from the 16-hour performance at John F. Kennedy Stadium in Philadelphia and Webley Stadium in London.

According to Cadogan, the rapid processing will allow Live Aid to realise $350,000 in interest that would have been lost if collections had been processed manually.

Original projections were for 30,000 pledges. Cadogan said it would have taken 40 persons from three to five months to process that number manually. As it turned out, more than 180,000 pledges were received. "This place was a zoo," Cadogan said.

To process manually the number of pledges received would have taken well over a year.

The pledge processing program was written in three days using the Mephisto fourth-generation language from Interactive Computer Systems, Ltd. based here, Cadogan said. Just days before the daylong concert, he was approached about the computer processing by the accounting firm for the Band Aid Trust, which is overseeing fundraising from the Live Aid concert.

DG had 40 operators working the day of and the day after the concert to handle the pledges. Cadogan had four shifts of 70 persons each to wrap up the collections using an MV/10000 and an MV/8000. Each credit card company will be given a magnetic tape with a record of pledges charged to accounts.

DG donated the use of its equipment and its London office for the collections.

[illegible] WORLD PHOTO

Tina Turner and Mick Jagger join voices to help eliminate world hunger

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Encore seeks to get on supermini map with Multimax

By Tom Henkel
CW Staff

If the love of a challenge is the driving force behind the entrepreneur, Ken Fisher is in his glory.

Fisher's company, Encore Computer Corp., came to this month's National Computer Conference (NCC), with the sole intention of showing off its latest product: the Multimax, a superminicomputer based on a multimicroprocessor architecture that some industry observers believe will be widely incorporated in the next generation of scientific-oriented computer systems.

But the 10-CPU Multimax operating at the National Semiconductor Corp. booth, along with systems from other start-up vendors using National Semi's 32032 microprocessor, is more than another box on display for the hoards of NCC tire kickers. To Fisher, the system is vital to launching Encore and its product line from the ranks of start-up firms to the level of a real player in the highly competitive superminicomputer marketplace.

Even though Encore is currently singing the praises of its Multimax to anyone willing to listen, the product will not make its official debut — that is, complete with solid pricing and delivery dates — until the Federal Computer Conference in Washington, D.C., this fall. The company's presence at NCC, Fisher said, is an attempt to generate some interest in the Multimax CPU, the company's Hoststation line of workstations and its Ally software.

Fisher conceded that luring potential customers away from well-established supermini vendors such as his own former company, Prime Computer, Inc., will be difficult.

However, Fisher contended that the relatively new architecture employed by the Multimax and the highly scientific bent of Encore's target audience will help ease the economic and competitive obstacles.

"When I, and my associates, built Prime, we got it rolling in a recession," Fisher said, noting that there are always potential customers, regardless of the economic climate. In fact, Fisher said, a slow period in the market can sometimes be a benefit to a start-up firm because small firms do not have to sell large numbers of systems to turn a profit.

But, Fisher said, the current downturn in computer sales is different from the 1974 recession during which Prime Computer was founded. This time, Fisher said, only the computer market is depressed. In 1974, the whole domestic economy was slow, consequently companies were freely spending money on computer systems believing that improving systems resources would generate a boost in corporate productivity.

> ‘When I, and my associates, built Prime, we got it rolling in a recession.’
>
> — Ken Fisher
> Encore Computer Corp.

"Everywhere I go I still find three-year backlogs," Fisher said, insisting that in spite of soft supermini sales during the past seven months, there are still potential customers who will jump at the chance to buy a system based on a relatively new architecture, such as the Multimax, if the company can prove the system offers better performance.

In fact, Fisher believes Encore will be able to convince enough users of the Multimax's performance advantages that the Wellesley, Mass., firm will be able to move a significant number of Multimax systems into the market in the next year.

Many of Encore's potential sales, however, may hinge on the firm's sealing a deal with Sperry Corp. to supply Multimax systems on an OEM basis. Encore and Sperry reached a tentative agreement whereby Sperry would have the option to buy up to 80% of Encore's first year's production of Multimax systems. Sperry's right to buy large numbers of Multimax systems would decrease in subsequent years.

But the tentative agreement has become snarled by details that are tying up its official signing. One of the details being debated is how many systems Sperry will buy on a volume basis.

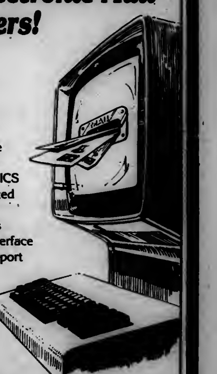
"Sperry is a way to get a fast start, but it is not our only hope," Fisher said. "We would value Sperry as a customer, but it's not a determining factor [in Encore's success]."

Info center meet planned

NASHVILLE — More than 65 sessions on information center-related topics, including strategic planning, resource management, training and staffing, will be featured at the Second Annual Information Center Conference and Exposition to be held at the Opryland Hotel here Aug. 18-22.

The conference is designed for people who plan and manage end-user computing, including information center managers, MIS directors and other corporate directors. Scheduled speakers will include Shaku Atre, president of Atre International Consultants, Inc., and Larry English, senior consultant with Performance Development Corp. Author and futurist David Pearce Snyder is slated to give the keynote address.

Conference registration is priced at $580. More information is available from the Conference Registrar, Information Center Conference, Weingarten Publications, Inc., 38 Chauncy St., Boston, Mass. 02111.



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WEST COAST UPDATE/JEFFRY BEELER

SACRAMENTO, Calif. — The state legislature is studying a proposal that would strengthen the warranty protection available to Californians who buy or lease computer products.

A.B. 1507 would require California-based hardware and software vendors to furnish with each of their products an implied warranty of merchantability — their ability to sell — and an implied warranty of fitness for a specified application.

The legislation would thus prohibit all advertising disclaimers to which such warranties have traditionally been subject, according to Alma Martinez, assistant to Assemblywoman Gloria Molina, the bill's sponsor.

A.B. 1507 would also require all California-produced hardware and software products to be accompanied by an express warranty that makes vendor advertising claims legally binding, Martinez said.

The provision referring to express warranties applies only to written, not oral, advertising claims. "I wish the bill did cover statements that are made orally because that's where most of the problems are," Martinez said. "But oral statements by advertisers would be almost impossible to monitor."

Under the bill, if a computer product fails to perform as advertised, a user would have up to six months to notify formally the vendor of the merchandise's shortcomings. The customer would then have the right to return the allegedly defective product to its developer and to demand a full refund.

California's hardware and software suppliers flatly oppose the bill. Through the Association of Data Processing Service Organizations, Inc., the vendors this month issued a statement criticizing the legislation, charging that it unfairly tries to make them the sole guarantors of a product's effectiveness.

Users as well as developers should bear at least part of the responsibility for ensuring that installations succeed, the statement issued by Adapso said.

Having recently passed the California Assembly, A.B. 1507 now goes to the state Senate's Insurance Claims and Corporations Committee. If the bill wins approval there, it would then move to the full Senate floor, back to the Assembly for concurrence on any interim amendments and on to the governor, who would have to decide whether to sign it into law.

■

HAYWARD, Calif. — Is bankruptcy contagious? Sleuths at the Center for Disease Control in Atlanta would probably scoff at such a notion. But executives at Viasyn Corp. here are taking no chances.

In early July, shortly after relocating to new corporate headquarters, Viasyn conducted a mock exorcism to rid the building of any troubled spirits that might have been left behind by its previous occupant.

As the multiuser microcomputer company's work force watched with varying degrees of amusement, a local entertainer masquerading as a medieval wizard launched into an elaborate ghost-busting routine that ended with the ritual banishment of an imaginary evil spook nicknamed "Bad Bit."

Viasyn's tongue-in-cheek housewarming was nothing if not unconventional. On the other hand, the firm's newly occupied headquarters has an unusual, even unsettling, history. The building's former tenant was none other than Osborne Computer Corp., which pioneered the portable microcomputer business and then, with equal fanfare, filed for protection under Chapter 11 of the Federal Bankruptcy Act.

DEC registers first new chip

WASHINGTON, D.C. — Digital Equipment Corp. last week registered its Microvax II chip set with the U.S. Copyright Office, becoming the first vendor to file a new product under the Semiconductor Chip Protection Act of 1984.

The Microvax II microprocessor chip is also the first 32-bit chip to be registered. Along with its floating-point coprocessor, the chip was developed in about 20 months to drive the Microvax II supermicrocomputer [CW, July 15].

Approximately 20 chips, including those from leading vendors like Motorola, Inc. and Harris Corp., have been previously registered under the act, according to Daryl Hatano, manager of government affairs for the Semiconductor Industry Association.

Those products had been commercially available before the law took effect last November and thus are only partially protected.

Protected for 10 years

The Microvax II chip's specific pattern of layered metallic, insulating and semiconductor materials will be protected from reproduction by other vendors, including those based in Japan and the UK, for 10 years.

Previously registered computer chips may continue to be imported or distributed by other organizations for an additional two years in exchange for royalties.

The protective legislation, signed by President Reagan last October, created the first new category of registered property since the Trademark Protection Bill of 1870. Lobbyists for the semiconductor industry had argued that, because of their unique nature, chips did not receive adequate protection under then-existing copyright and patent laws.

FCC to ease limits?

WASHINGTON, D.C. — The Federal Communications Commission last week proposed to relax existing structural separation requirements barring the seven regional holding companies and AT&T from combining computer-enhanced services to underlying communications offerings.

In opening a Third Computer Inquiry, the FCC is proposing to permit services like protocol conversion, co-location of computer processing equipment with transmission facilities and the provision of an integrated services digital network.

The Third Computer Inquiry, according to the FCC, will decide such questions as whether the divested Bell operating companies can provide data communications services and whether AT&T can offer an unregulated protocol conversion service.

ISDN from page 1

bit/sec. link that is divided into two 64K bit/sec. channels for voice/data transmission and one 16K bit/sec. channel for signaling and low-speed data transmission.

To support interface if market need exists

Dick Snowden, director of service concepts for AT&T Communications, said, "We are prepared to support the basic interface if we find a market need for it. It is not something we see much of a need for."

Snowden added that he expects to see the divested Bell operating companies implement both the Basic Access and Primary Rate interfaces over time.

New York Telephone spokesman John Quinn said the company's test would begin in the laboratory in the first quarter of 1986 and would be extended to a field test at a later date.

Wallace is a staff writer with On Communications *magazine.*

Courses out for IBM systems

ARLINGTON HEIGHTS, Ill. — Advanced Systems, Inc. has introduced four computer-based training courses, two for the IBM Personal Computer and two for use on IBM mainframes. It has also introduced two management courses, which are presented on videotape.

Two of the computer-based training courses, MVS/XA: Basic JCL and MVS/XA: Production JCL, reportedly are for use on the user's IBM Personal Computer attached to a laser disk player, which is not included. The video portions of the course are recorded on the laser disk, which interacts with the software on the Personal Computer to provide the instructional program. The basic JCL course reportedly defines the role of JCL in job processing, among other features. The Production JCL course outlines advanced JCL techniques.

Another of the new computer-based courses is Xedit For New Users, which reportedly teaches Xedit commands needed to create a file and modify data. It runs under all IBM mainframe operating systems.

The IDMS/R Education Series and Reference Library, a 26-unit series of videotape lessons, was reportedly designed for data base administrators and information processing professionals. The courses reportedly teach the concepts of data base design and the Automatic System Facility of IBM's IDMS/R, among other topics. They are offered on ½-in. videotape and in ¾-in. tape. The MVS/XA: Basic JCL and MVS/XA: Production JCL courses are licensed beginning at $90/mo per module. The Xedit for New Users course is priced from $800 for a 3-mo license to $4,000 for a perpetual license. Modules in the IDMS/R Education Series and Reference Library are priced beginning at $50/mo.

Advanced Systems is located at 155 E. Algonquin Road, Arlington Heights, Ill. 60005.

Oregon VDT legislation vetoed

Governor cites existing means to ensure safety

By Maura McEnaney
CW Staff

SALEM, Ore. — The progress of VDT legislation in this state came to a grinding halt recently after Gov. Victor Atiyeh (R-Ore.) vetoed a bill establishing guidelines for the purchase and use of VDTs here.

In a July 12 letter vetoing the bill — which passed the Oregon Senate just one vote short of unanimous and later cleared the House of Representatives by a 31:28 vote [CW, June 24] — Atiyeh reiterated his long-held position on the issue.

Atiyeh said that while no safety and health risks have been connected to VDT use, "state government already has in place a means to monitor work sites and health and to enforce compliance when specific hazards are identified."

Legislation's requirements

The Oregon VDT legislation called for the development of purchasing specifications for VDTs and workstations for inclusion in bid proposals issued by public agencies.

The bill required the director of the state's Worker's Compensation Department to set up ergonomic guidelines for VDT users working at terminals more than four hours a day.

It also required the establishment of an education and consulting program about VDT health and safety issues.

Committee examined VDT safety

During the last biennial legislative session, the state established a committee to examine safety issues surrounding VDTs in the workplace.

That committee, made up of people both in support of and opposed to VDT legislation, recommended that the state introduce legislation addressing the ergonomics of VDT use, according to Chuck Mendenhall, government relations director for the Service Employees International Union (SEIU) Local 503.

The SEIU has been a proponent of VDT legislation throughout the country this year.

When the Oregon VDT legislation attracted national attention, heavy lobbying efforts got under way to kill the bill, Mendenhall said.

In June, the margin of approval was reduced in the House of Representatives on a vote of 31:28. Much of the lobbying effort came from the governor's own Washington County, Mendenhall said, and soon, "The governor was convinced that he would be the bottom line for the legislation."

Requiring safety and health guidelines as well as purchasing specifications for VDTs "only creates obstacles to a flexible enforcement policy which should be directed toward the greatest needs," according to the governor.

Issco revamps graphics aids for 32-bit units

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — Integrated Software Systems Corp. (Issco), whose graphics programs have traditionally operated only on medium- and large-scale mainframes, is now reportedly making its full product line available on selected 32-bit workstations.

As part of an effort to broaden its target market, Issco has adapted its existing Tell-A-Graf, Tellaplan and Disspla software offerings to run on the Digital Equipment Corp. Microvax II. The programs also reportedly work with the Hewlett-Packard Co. HP 9000 and its Apollo Computer, Inc. rival.

Although all three packages can now reside on a single-user system, Issco claimed they provide the same functions as their mainframe-based counterparts. In addition, the workstation-resident products sell for less than one-tenth of what they would cost on a large-scale VAX machine, according to Issco's newly appointed president, Meldon Gafner.

Coupled with a 32-bit processor, the company maintained that the programs will allow users to create graphics locally, dump the results temporarily to a low-cost printer and later make any necessary revisions. Using the established communications links between, for example, a Microvax II and full-scale VAX system, users can upload the finished graphs to a central mainframe and take advantage of its shared, high-quality output devices, Gafner said.

In quantities of one to nine, the workstation versions of Issco's Tell-A-Graf business graphics package, Disspla technical graphics system and Tellaplan project management products are available immediately for a one-time fee of $3,600 per module. Each product also entails an annual renewal fee ranging from $288 to $3,600 per package.

Issco is headquartered at 10505 Sorrento Valley Road, San Diego, Calif. 92121.

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Until recently, you had to abandon the business computer language when you developed microcomputer application software. The available micro COBOLs were inadequate—too limited, too slow. The best alternative—the XT/370 or AT/370 using IBM's COBOL—was very expensive and still too slow. To get acceptable performance, you had to retrain your programmers in Pascal or C.

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- Multiple entry points
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Our users report that their systems run up to 20 times faster when compiled by Realia COBOL. That's compared to our nearest micro competitor. The ratio is up to 100 times faster when compared to any of the others.

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Realia COBOL is priced at $995, including one year of maintenance and upgrades. Subsequent maintenance and upgrade contracts are currently priced at $125/year/copy. Available for the IBM PC, PC XT, 3270 PC, PC AT, PC-compatibles, and the TANDY 2000.

Realia COBOL. What a relief.

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Conference attendees eye optical disk technology

By James Connolly
CW Staff

CHICAGO — Optical disk storage was the hot technology, the products in demand were networks and the key issues centered on personal computer management.

Those were some of the points made by attendees at the recent National Computer Conference (NCC) here in conjunction with a *Computerworld* sampling of opinions. Questionnaires distributed at NCC and returned by conference attendees also revealed the following:

- The primary purpose for attending NCC was to learn about new technologies, followed distantly by equipment shopping and job hunting.
- More than half of the attendees representing user organizations said they plan to acquire mainframes or superminis in the next year.
- Interests in software focused on data base management and artificial intelligence, including expert systems applications.
- Attendees were split on whether the economy has impacted their hardware acquisition plans, citing more negative than positive results, but they felt strongly that software acquisition was unaffected by a national economy that they said will improve in the next year.
- Microcomputer acquisition was almost evenly divided among MIS/DP and end-user departments, with MIS/DP holding the slight edge in authorizing microcomputer purchases.
- Dealing directly with the manufacturer is the preferred method of acquiring microcomputer software, as cited by twice the respondents than those who chose the second favorite source, retail stores.
- The preferred sources for system maintenance are vendors, followed by in-house and third-party maintenance firms.
- Most respondents have forsaken name-brand microcomputer software in favor of low-cost alternatives, while emphasizing the need for the alternatives to be reliable.
- Attendees feel software piracy is an overblown issue.

> *'It seems that optical disks would be superb for sending out data bases to our clients.'*
>
> — Bryan Kocher
> Digital Research, Inc./McGraw Hill, Inc.

Optical disk storage systems and media were most commonly cited when attendees — including DP managers, computer users, vendors and consultants — listed the products and technologies that they wanted addressed in NCC technical sessions or displayed on the show floor.

"I think there was an adequate amount of technical information available regarding optical storage. Optical is pretty much coming out from under the covers," observed Bryan Kocher, a manager with Digital Research, Inc./McGraw Hill, Inc. of Lexington, Mass.

Kocher, who is exploring the possibility of moving Digital Reseach's economic data base to optical disk for use by existing time-sharing customers on personal computers, said that NCC '85 featured more optical media vendors than NCC '84 and that prices have dropped, in one case from $800 to $350 per 12-in. disk. He noted that at least one NCC exhibitor plans delivery of erasable 3½-in. disks within a year.

"It seems that optical disks would be superb for sending out data bases to our clients. We could put the data on at a central site and put the disks in express bags for overnight delivery," he added.

John R. Pearson of the State of Illinois Information Resource Management Office said of his interests, "Video/laser disks. There are no other new products or technologies."

Several attendees who expressed interest in optical storage also mentioned local-area networks for personal computers and laser printers.

A quarter of the respondents said they were looking at networking or personal computer communications solutions, while several more listed micro-mainframe links as their key interests.

Europe's micro purchases jump 57% in first half of 1985

By Clinton Wilder
CW Staff

The volume of microcomputers purchased by Western European users grew 57% in the first half of 1985, according to Intelligent Electronics Europe (IEE), a Paris-based market research firm.

In presenting its latest market figures and predictions, analysts from the 3-year-old firm contrasted the continued strong growth of the European market to flagging U.S. demand in the last year. "In Europe, we've been bombarded with news of the personal computer shakeout," IEE analyst Gordon Curran said. "But we can assure you that the European market is alive and well."

Curran predicted that the total sales of personal computers in Western Europe would increase from $2.9 billion in 1984 to $4.5 billion this year. He said four nations accounted for three-quarters of the sales in 1984,.with British users buying 24% of the micros sold; West German users, 23%; French users, 17%; and Italian users, 10%.

The outlook through the end of the decade in Europe continues to be encouraging, according to IEE. The firm's projections show the current installed base of nearly 3 billion units growing steadily to 11.9 billion units by 1990.

The European market's relative infancy accounts for the growth potential, IEE analyst Brigitte Morel said: Less than 5% of Western Europe's white-collar work force currently use micros, but Morel predicted a 22% penetration rate by 1990.

Small business market share

Small businesses accounted for 37% of European micro sales in 1984, falling just short of the 39% share of the market held by large corporations. Morel said the vast number of shopkeepers and artisans on the continent represent vast growth potential in the single-unit, small business market sector.

"There are 50 million small shopkeepers in Europe, and these are people with a great need for help and assistance from computers," Morel said. She said such demand would be especially evident in less industrialized nations such as Spain and Greece. In Spain, IEE predicted shipments would nearly double this year from the 26,000 units purchased in 1984.

In IEE's vendor breakdown, the IBM Personal Computer continues to gain market share for Big Blue. IEE said IBM's domination will jump from 1984's 28% to a 36% market share this year. The firm predicted Italian vendor Ing. C. Olivetti & Co. will displace Apple Computer, Inc. for the No. 2 spot in 1985, its second year in the market.

"The strength of Olivetti's partnership with AT&T has helped them," Curran said. "And their growth is a good reflection of the strength of the market, because almost all of their sales are to new customers," he added.

Troubled Apple will see its share drop from 17% to 10% this year, IEE predicted. Although Apple continues to lead in the French market, Morel said, the firm has been badly hurt overall by the uncertain positioning of the Macintosh. "The price of the Macintosh has put it out of reach [for] many private users . . . and is clearly not accepted by medium- to large-size companies because of its incompatibility and lack of communications features," she said.

In micro software, Morel said, native firms in several non-English-speaking countries dominate the word processing market, but U.S. leaders such as Lotus Development Corp. and Ashton-Tate have maintained their stranglehold on other applications. Only three small European vendors sell data base management programs, for example, and no European vendor has a significant presence in spreadsheet or integrated packages.

Chip vendor representatives wield claims at NCC session

By Tom Henkel
CW Staff

CHICAGO — "My chip is better than your chip," was the thrust of a highly marketing-oriented session on up-and-coming microprocessors at the National Computer Conference this month.

Each of four panelists — representing National Semiconductor Corp., Zilog, Inc., AT&T and Motorola, Inc. — promised that firm is committed to providing the highest performance microprocessor on the market, and each either flatly stated or strongly implied that his microprocessor was better than that of his competitors.

Session leader Richard Mateosian, representing National Semi, set the tone for the session when, in presenting details of National Semi's 32332 microprocessor, he used several charts that claimed the 32332 was 1.06 times faster than Motorola's just-released 68020. Mateosian said the 32332 would be shipped to sample customers in December.

Clara L. Serrano, the panelist representing Motorola, disagreed with Mateosian's performance claims and said Motorola could produce similar charts that indicate the 68020 is faster than the 32332. She added that she did not come to the session with specific information comparing the 68020 with other vendors' microprocessors.

Serrano, in giving a general overview of the 68020, said the microprocessor offers at least four times the performance of the older 68000. She claimed the 68020 offers performance of roughly 2 to 3 million instructions persecond (Mips). She also pointed out that the 12-MHz version of the 68020 is available in volume quantities now and that the chip has already been shipped.

Benjamin Ng, one of the microprocessor architects at AT&T, presented details of that company's 32100 chip set. Ng said the CPU in the 32100 chip set offers roughly the same internal performance as the 68020, in the the 2- to 3-Mips range. He said the CPU is immediately available.

In presenting details of Zilog's Z80000 microprocessor, company representative Robert Anderson said that microprocessor will offer performance ranging from 1.1 Mips for a 10-MHz version to 4.7 Mips for the top-end, 25-MHz model. Anderson said sample quantities of the Z80000 will be available in the fourth quarter.

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To attend the next free, half-day seminar in your area or receive additional information, write Oracle Corp., Dept. C4, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350. Following is the ORACLE seminar schedule:

ORACLE Seminar Schedule

Albany	Sept 19
Albuquerque	Sept 19
Anchorage	Aug 29
Atlanta	Jul 25, Sept 18
Austin	Aug 6
Boise	Jul 30
Boston	Jul 16, Aug 14, Sept 17
Chicago	Jul 17, Sept 19
Cincinnati	Sept 10
Cleveland	Aug 6
Dallas	Jul 16, Aug 8, Sept 11
Denver	Jul 18, Aug 13, Sept 19
Detroit	Jul 23, Aug 20, Sept 24
Greensboro	Aug 1
Houston	Jul 30, Aug 28, Sept 24
Huntsville	Jul 31
Indianapolis	Sept 17
Kansas City	Sept 12
Los Angeles	Jul 25, Aug 27, Sept 26
Minneapolis	Aug 1
New Orleans	Aug 13
New York City	Jul 31, Aug 14, 28, Sept 11, 26
Newport Beach	Aug 14, Sept 17
Oklahoma City	Sept 17
Omaha	Aug 7
Orlando	Jul 17
Philadelphia	Jul 18, Sept 18
Phoenix	Aug 6
Portland	Aug 6
Rochester	Jul 23
Sacramento	Aug 8
St. Louis	Aug 8
Salt Lake City	Jul 16, Sept 24
San Diego	Sept 10
San Francisco	Aug 1, Sept 5
San Jose	July 25, Aug 15, Sept 26
Tulsa	Aug 15
Washington	Jul 25, Aug 8, Sept 12, 26

Chicago: 312/726-1167 **San Francisco: 415/541-9400** **Washington: 301/951-9190**

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NEWS

WORLD DIGEST

CW International News Network

TOKYO — At a recent press conference here, Fujitsu Ltd. announced that future production and development of its microcomputer systems will be converted from Digital Research, Inc.'s CP/M to Microsoft Corp.'s MS/DOS operating system. Fujitsu's line of 16-bit personal computers will continue to use the Intel Corp. 8086, 80186 and 80286 microprocessors but will now run MS/DOS Version 3.1 and compatible software. Fujitsu has also announced plans to incorporate Microsoft's Xenix on some hard-disk models in order to support environmental applications development.

DARMSTADT, West Germany — At a recent conference here, more than 300 members of Computer Professionals for Peace and Social Responsibility met to discuss the U.S.-planned Strategic Defense Initiative (SDI) and to propose resistance, much like their counterpart organization in the U.S., Computer Professionals for Social Responsibility in Palo Alto, Calif.

In a letter to West German Chancellor Helmut Kohl, the computer professionals explained that the security required for the SDI project could not be positively attained due to the magnitude and intended purpose of the project. The professionals, gathered from several European countries, also claimed that the drain on brain power and financial resources for SDI could not be justified.

MUNICH, West Germany — Members of the Open Unix Group — Groupe Bull, ICL Co., Nixdorf AG, Ing. C. Olivetti & Co., N. V. Philips and Siemens AG — who recently chose AT&T's Unix as the European Standard programming language, have summarized their efforts at standardizing Unix in a "Portability Guide," which should be available in September.

The reference work is based on AT&T's System V Interface Definition and will incorporate all the work the group has done since their founding in November 1984. The report will provide the suggested guidelines for future software development. Along with such problems as a common Unix floppy disk format, the group has tackled some problems typically not encountered in the U.S., such as the language — Unix is documented in English and the character set used is English.

STUTTGART, West Germany — IBM Deutschland GmbH here announced a major reorganization of its marketing sales divisions. Two areas that had been divided since 1981, Information Systems/Projects and Information Systems/Applications, have been rejoined; all dealer activities have been incorporated into the Dealer Marketing & Sales division; and there are now only five regional directors for West Germany — in Hamburg, Dusseldorf, Frankfurt, Stuttgart and Munich.

The reasoning behind this, IBM said, was to shorten the decision-making and reporting process. Industry insiders say that the measures reflect developments in the U.S., where the Personal Computer divisions, operating in the red, are being integrated into the rest of IBM — and kept on a shorter corporate leash.

SYDNEY, Australia — Repeat business, continuing for 15 years, has finally accumulated in an order worth $25.5 million for ICL Australia Ltd. The contract, signed by Woolworths Ltd., is for the supply of seven of ICL's Series 39 mainframes, formally released here two weeks ago, plus 150 supermarket scanning systems. It follows an initial order by Woolworth's last April for 50 of the same systems to be used in pilot sites. Woolworth's has been an ICL user since 1970.

CALENDAR

WEEK OF AUGUST 25

AUGUST 25-30, DALLAS — **Systems Development: Design Phase.** Contact: Arthur Young & Co., Arthur Young Education Center, 1950 Roland Clarke Place, Reston, Va. 22091.

AUGUST 26, NEW YORK — **CICS/VS Application Programming — Command Level.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Aug. 26-30 in Atlanta and Aug. 28 in New York.

AUGUST 26-27, DALLAS — **The Information Center.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

AUGUST 26-27, ARLINGTON, VA. — **Networking the IBM Personal Computer.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Aug. 28-29 in Hasbrouck Heights, N.J.

AUGUST 26-27, SAN ANTONIO — **CICS/VS Performance and Tuning.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J 07024.

AUGUST 26-27, ST. LOUIS — **Unix/Xenix.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Aug. 28-29 in Philadelphia.

AUGUST 26-28, CHICAGO — **Audit and Control within IBM's VM Operating System.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

AUGUST 26-28, CHICAGO — **IBM's SNA: Security and Audit Concerns.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

AUGUST 26-28, CHICAGO — **Testing Computer Software.** Contact: U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

AUGUST 26-28, HARTFORD, CONN. — **Office Automation.** Contact: The Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

AUGUST 26-28, LONG ISLAND, N.Y. — **PBX/CBX.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

AUGUST 26-28, MEMPHIS — **Data Communications Systems.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

AUGUST 26-28, MONTREAL — **Local-Area Networks.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

AUGUST 26-28, NEW YORK — **The IBM Personal Computer.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

AUGUST 26-28, SAN DIEGO — **The IBM Personal Computer.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held in Cherry Hill, N.J.

AUGUST 26-28, PARSIPPANY, N.J. — **Vsam in Cobol.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

AUGUST 26-29, DENVER — **CICS/VS Application Design.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Aug. 27 and 29 in New York.

AUGUST 26-29, FORT LEE, N.J. — **IMS/DB (DL/1) Application Programming.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 26-29, FORT LEE, N.J. — **Vsam: Its Structure and How to Use It.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held in Los Angeles.

AUGUST 26-29, NORFOLK, VA. — **Using Microcomputers in Government.** Contact: U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

AUGUST 26-29, SAN FRANCISCO — **Integrated Information Technology Conference and Exposition.** Contact: Jill Nieman, National Trade Productions, Inc., 2111 Eisenhower Ave., Alexandria, Va. 22314.

AUGUST 26-30, HOUSTON — **Analysts' Skills Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

AUGUST 26-30, LOS ANGELES — **CICS Application Programming — Macro Level.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 27-29, HOUSTON — **SAS Basics Course.** Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

AUGUST 27-29, CARY, N.C. — **SAS Applied Time Series Analysis and Forecasting Course.** Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

AUGUST 28-29, SAN ANTONIO — **Recovery/Restart.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 5-6 in Fort Lee and Chicago.

WEEK OF SEPTEMBER 1

SEPTEMBER 3, NEW YORK — **VSAM: Its Structure and How to Use It.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 5, 10 and 12 in New York.

SEPTEMBER 3-4, CHICAGO — **CICS/VS Performance and Tuning.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 3-4 in Fort Lee.

SEPTEMBER 3-6, ATLANTA — **Vtam: From Start to Finish.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 3-6 in Denver.

SEPTEMBER 3-6, FORT LEE, N.J. — **IMS/Data Communications Programming.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

SEPTEMBER 3-6, SAN ANTONIO — **CICS/VS Logic and Debugging.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 3-6 in Fort Lee.

SEPTEMBER 4, NEW YORK — **CICS/VS Application Programming — Macro Level.** Contact: On-Line Software International, Inc., Fort Lee Executive. Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 6, 9, 11 and 13 in New York and Sept. 9-13 in San Antonio.

SEPTEMBER 4-6, LOS ANGELES — **Information Systems Architecture.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

SEPTEMBER 5-7, SAN FRANCISCO — **Third Personal Computer Faire.** Contact: Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159.

WEEK OF SEPTEMBER 8

SEPTEMBER 8-11, CAMBRIDGE, MASS. — **1985 Society of Manufacturing Engineers (SME) World Congress on the Human. Aspects of Automation.** Contact: SME, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

SEPTEMBER 8-12, BOSTON — **Managing the Explosion: End-User Computing and Emerging Technologies.** Contact: Kimberly Oandia, Society for Information Management, Suite 600, 111 East Wacker Drive, Chicago, Ill. 60601.

SEPTEMBER 9-10, ATLANTA **Principles of Prototyping.** Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

SEPTEMBER 9-11, VANCOUVER, B.C. — **International Communications and Computer Exhibition.** Contact: Tracon Exhibitions, 202-535 W. 10th Ave., Vancouver, B.C., Canada V5Z 1K9.

SEPTEMBER 9-11, WASHINGTON, D.C. — **Federal Computer Conference.** Contact: Federal Computer Conference, P.O. Box N, Wayland, Mass. 01778.

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SAS Institute Inc. Announces

Lattice C Compilers for Your IBM Mainframe

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Development had progressed so well that we expanded our efforts to include the entire SAS System on a PC, written in C. And to insure that the language, syntax, and commands would be identical across all operating systems, we decided that all future versions of the SAS System—regardless of hardware—would be derived from the same source code written in C. That meant that we needed a C compiler for IBM 370 mainframes. And it had to be good, since all our software products would depend on it.

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- **Optimization of the generated code.** We know the 370 instruction set and the various 370 operating environments. We have over 100 years of assembler language systems experience in our development staff.
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- **Generated code identical for OS and CMS operating systems.** You can move modules between MVS and CMS without even recompiling.
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Tomorrow...

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EDITORIAL

The rollover in retrospect

Statistics and surveys are wonderful things. Datapro Reserach Corp.'s most recent statistical effort, for instance, produced some numbers that may help to shed light on what has been happening to hardware manufacturers' own numbers.

Each year for the past six years Datapro has canvassed the user community, and each year around National Computer Conference time, *Computerworld* has published charts and a story about Datapro's results.

And each year the headlines and stories recount user satisfaction with their systems. Despite the occasional piece of bad news, the numbers tend to confirm a long history of user satisfaction with their hardware systems.

But this year Datapro's statistical picture is significantly different in one key aspect. Although a clear majority of users surveyed continued to express satisfaction with their systems and had no reservations about recommending their systems to prospective buyers, one row of Datapro numbers changed dramatically. This, in turn, changed the story and changed the headlines. The row in question contained the average-age-of-system numbers and showed that the majority of respondents had obtained their systems during the past year.

The year 1984 appears to have been a very active one for Datapro's respondents — busy with trading, buying and upgrading of their systems. Of the more than 900 systems managed by the Datapro sample, the average system age was 9¼ months. A year earlier, the Datapro average-age-of-system row had shown that of 1,000 systems reported in the survey, the average age was more than 3 years.

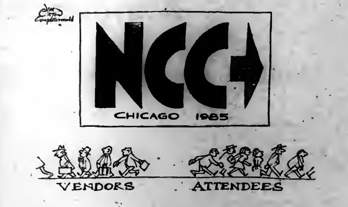
Besides indicating that there was a widespread rollover in mainframe hardware last year, what else did the Datapro survey reveal?

- Systems overwhelmingly met user expectations. This indicates that the purchasers were generally well informed about their systems' capabilities, and the systems lived up to the sales departments' representations.
- Outright purchase was the preferred acquisition method.
- Respondents were generally willing to recommend their vendors' systems to others. The one dip below the 90th percentile occurred in the anonymous "other" column.
- The respondents, on the average, indicated that their systems performed well — not excellently, not poorly, but well.

How does all this stack up against previous years? About the same. There should be no great surprises involved in using mainframe systems, and the respondents indicated that there were none for them.

When combined with the fact that these appear to be new systems under review, the similarity of this year's responses with those of previous years, covering older systems, indicates that mainframe vendors have achieved a consistency of product quality. A good mechanic makes a good machine. The surveys show that user satisfaction decreases as system life cycles come to an end, but users' attitudes toward the vendors have remained consistent even as the systems changed with time.

One question remains, however. Is the massive rollover in systems that occurred in 1984 a cyclical phenomenon? The numbers for previous years back to 1980 revealed no similar pattern, but those years saw businesses in the U.S. emerge from a major recession. We'll just have to wait until the current systems are 3 years old. The year 1987 may be another boom year for the computer industry.



LETTERS

Copy protection seen as nuisance

The passing of Visicalc [CW, June 17] alerts us to the inherent hazard of copy-protected software: If my program diskette becomes unreadable, where do I go?

Whatever software I depend upon, I must be able to use it indefinitely in my own machine, without reliance on a vendor that may charge any price at any time or may cease to exist. Therefore, I treat my store-bought original software diskettes like photographic negatives — I only run from "prints."

Sometimes this requires a "copy-cracker" to circumvent vendor copy-protection schemes. I think this nonpiracy use of copiers is justified, but it is a big nuisance.

Copy protection is an expression of pernicious greed by vendors. I have no doubt that some software marketers would love to encrypt our very eyeballs and charge a pound of flesh royalty for every instance of use of their precious code. It needn't be this way. We can stop this nonsense if we all boycott copy-protected software.

Peter F. Klemeter
Golden, Colo.

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VIEWPOINT

Customer satisfaction in the data business

THE DATA CENTER
John P. Murray

How many data center managers are really concerned about the perception of the value of their operations to their client community? Of those who do have such a concern, how many are actively engaged in measuring and improving their data center service levels?

I suspect the answer to the first question is "many." I suspect the answer to the second question may well be, "not very many." A number of data center managers seem to feel that if the phone is not ringing madly with complaints from clients, everything must be going fairly well. In fact, it may be that the clients have become so frustrated they simply no longer bother to complain about poor data center service. You can be certain, however, they are complaining to someone.

The data center, like it or not, is a service business. The continued good will and support of clients — its users — are key to both the acceptance of the data center effort and the career progression of the management team. Because the data center manager ultimately stands to gain or lose more than anyone else in the handling of this issue, the climate relative to the clients should be of paramount interest.

Some have taken steps to gauge clients' opinions of the data center service level. Some have used surveys designed to gather various types of data about the different aspects of the center's function. That data is then used to judge how well data center managers are doing and to identify those areas that may require additional attention to improve the overall service level.

Data base of survey results

Building a data base of survey results provides a means of developing trends that can highlight those areas that may be improving or deteriorating. Using that information can assist in building strategies that will effect improvements. It can also be used to refute arguments about the decline in service levels if such is not, in fact, the case.

So, the use of these surveys does help. The problem is that the process of sending out a data center survey to clients only can be rather one-dimensional. This is because these surveys only usually ask the clients to rate the current level of service from their particular perspective and are based on a narrow range of issues — these questionnaires often contain fewer than 20 questions.

Although a well-designed survey, even of this limited size, can provide significant information about the preceptions of the clients, they do have several faults when you think about it. In addition to asking specific questions, these surveys attempt to elicit only cursory information about additional changes or improvements clients would like to see. They usually do not provide any way to determine the perceptions of those who work in the data center relative to their view of the service level.

At least one organization has developed a method that can be used to provide a much more comprehensive approach both to judging and increasing client satisfaction levels. I became aware of this approach when I saw a presentation by Richard Mathews, president of Mathews & Co.

Improved communication between MIS, clients

It was Mathews' contention that use of his system establishes improved communication between MIS and its clients. He also stated that use of the process will assure increased quality of the MIS product. In fact, he maintained that his company "does not know of a single case where our system failed to improve dramatically [information systems] service to customers while producing significant savings in time and dollars."

There are two aspects of this system that set it apart and probably make it more effective than the "roll your own" survey many currently conduct. First, it is a comprehensive survey, consisting of more than 90 questions, conducted by a third party who can bring objectivity to the task. It also provides the basis for matching the results of the survey against the Mathews & Co. composite data base of other organizations it serves. This helps address the "Compared to what?" issue that can arise when surveys present information based upon one installation.

As I understand the process, the people who work in the data center are asked to rate the service they provide on the same basis as the clients. According to Mathews, sometimes the disparity between these two views of the service level can make a significant contribution to opening lines of communication. If nothing else, the data center employees can also fill out the survey the next time there is an in-house survey. The results of such an effort could prove interesting.

This is not necessarily an exclusive endorsement of Mathews & Co. — there may be other firms that provide such a service. The point is that we need to take advantage of every opportunity to improve our service in the customer's view.

Murray is director of management and information services for American Breeders Service, a DeForest, Wis., division of W. R. Grace & Co. and is the author of Management Information Systems as a Corporate Resource.

Controlling change from a practical perspective

READER'S PLATFORM
Brooks W. Johnson

Nearly everyone responsible for the development of systems has experienced the frustration associated with change during the development process. The inability to limit this change results in missed target dates, ineffective use of resources, reduced morale and cost overruns. It is imperative, therefore, to limit change wherever possible.

The classic approach to controlling change has been succinctly stated by the maxim "Freeze the specification." This approach dictates that after obtaining the necessary user sign-offs, the specifications are cast in concrete and cannot be changed.

If change is effectively outlawed, it cannot be a problem. However, in systems of only moderate complexity, many months may pass between these sign-offs and actual implementation. In these cases, freezing the specifications is not simple; it is simplistic. The specifications cannot be frozen any more than the business itself can be frozen.

Changes to the business during the development of large systems is inevitable. It is equally inevitable that some of these changes will directly affect the system.

Management will necessarily require that the changes be incorporated into the system, but not restricting change would be opening a Pandora's box making a successful implementation virtually impossible. The first step in limiting change is to classify each request as either a change to the specification or a change to the scope.

Changes to the specifications are those items that directly affect the logical design and viability of the system. These changes must be made for the system to remain functional.

Changes to the scope are those items that can be done independently of the system even though they may be dependent upon the system. This is not a contradiction; the distinction is whether the system is dependent upon the change or whether the change is dependent upon the system. Once this categorization has been made, the second step is to freeze the scope of the system.

The simplicity of freezing the scope is obvious, yet it is often overlooked. This is partly because changes to the specifications are usually imposed by the user, but changes to the scope are often initiated and condoned within the MIS department.

It is extremely tempting even in the early stages of development to expand upon the initial project scope. This is not to imply that the initial analysis be restricted to the original project definition.

This amplification of the scope of the analysis should not, however, be translated into a corresponding expansion of the project definition. If there are justified reasons for increasing the scope, all phases of the development need to be redefined. This includes new project definitions, resource requirements and schedules.

Changes during early phases

Changes in the scope during the early phases usually result in extended deadlines and additional resource requirements. It is those changes that occur later in the development process that present problems. These changes, or enhancements, are often the result of increased awareness of the system potential by the user. It is compounded by a corresponding increase of the user's needs by the MIS department.

These changes are often casually mentioned by the users and generally accepted into the specifications because they are easy to accommodate.

In many small shops where there is direct contact between programmers and users, the changes may even be incorporated without the knowledge of MIS management. Usually, however, the MIS management accepts the enhancements to improve the reputation of the department with minimal effort.

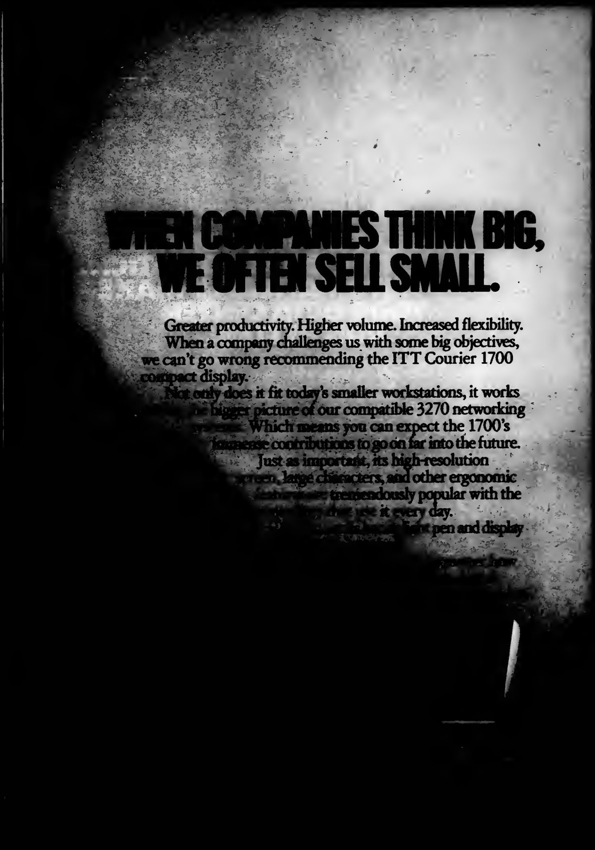
Although many of the changes can be easily accommodated, problems soon arise when what at first appeared to be simple, suddenly becomes complex. Because these enhancements rarely have the benefit of thorough analysis, it is often only after considerable resource expenditure that the complexity of the request is discovered.

The user soon becomes frustrated with the failure of MIS to accommodate what appears to be a simple addition. To save departmental reputation and to reap some benefits, additional resources are used to complete the change.

Expansion of the project scope, especially outside of the formal request procedure, is playing with fire. Changes to the specifications will provide more than enough complications to the project. In those few cases where the requirements are misjudged, the results will be disastrous.

The best course is to resist the temptation and treat all changes in scope as separate projects. This will allow both proper study and allocation of resources to each request. The way to ensure a positive perception of the MIS department is to provide systems that perform tasks as originally defined and to produce these systems within the budget and on schedule.

Johnson is a Albemarle, N.C.-based DP manager.



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Incompatible systems exchange E-mail

Sears uses Disoss, Profs to network subsidiaries

By John Desmond
CW Staff

NEW YORK — At Sears Communications Network, Inc., users of two incompatible IBM office system software products, the Professional Office System (Profs) and the Distributed Office Support System (Disoss), are sending electronic mail to each other via a custom interface.

That method of overcoming product limitations is typical of the way Sears Communications is stretching the capabilities of IBM's office system software. The company is using Disoss in an electronic mail network that includes Sears Communications, the Allstate Insurance Co. and the Sears Merchandise Group.

Gerard R. Weis, vice-president of Data Communications and Software Service with Sears Communications Network of Arlington Heights, Ill., said, "From a standpoint of communications technology, the advantage of using Disoss is that it provides within the IBM product set a common denominator to facilitate the exchange of electronic messages and revisable form documents."

Speaking at a recent Yankee Group seminar on office automation here, Weis detailed how Sears uses the IBM hardware and Systems Network Architecture (SNA) network it has in place for electronic mail and library functions between its five business groups. Sears Communications provides communications services for Allstate; Coldwell Banker Group, a commercial and residential real estate firm; Dean Witter Reynolds, Inc., a brokerage and financial services company; Sears Merchandise, the retail and catalog merchant; and Sears World Trade, which is involved in international merchandise trade.

Combined, the network encompasses 110 mainframes; 137 IBM 3725-type communications controllers; 34,500 3270-type terminals; 28,500 point-of-sale terminals linked to IBM Series/1 minicomputers; 168,120 circuit miles of AT&T-type wiring; and a $50 million-plus annual operating budget.

Of the five, only Dean Witter currently has no plans to use Disoss. Coldwell Banker and Sears World Trade are just beginning to use the product. No corporate mandate requires use of Disoss or any other product; each business group makes its own buying decisions, Weis said.

Sears Communications' office automation strategy is to provide services for document preparation, filing and retrieval; messaging, document and file distribution; and professional support such as calendaring, Weis said.

See SEARS page 34

- ■ Martin Marietta Data Systems unleashed Ramis II interfaces to IBM's DB2 and SQL/DS and added decision support capabilities to its MAS-Manufacturing System software/24
- ■ Shopsmith unveiled Shopmon, a performance monitor for IBM MVS data centers/24
- ■ Litton Computer Services will provide access to Management Science America's accounting software via its remote computing service/24

Ramis II, Natural branching out

SOFTALK
John Desmond
CW Senior Writer

If fourth-generation languages are ever to outdistance Cobol, the products must be useful to a wider range of users than that third-generation mainstay.

For two major fourth-generation language vendors, the road to wider acceptance leads in opposite directions. Martin Marietta Data Systems has a loyal information center following for the former Mathematics Products Group, Inc.'s Ramis II fourth-generation language. The challenge for it is to have Ramis II accepted in mainstream DP shops, as opposed to end-user-oriented environments. Software AG has a loyal professional programmer following for its Natural fourth-generation language. The challenge for it is to tap the end-user applications development market.

Users in both environments would benefit from the two vendors' success in implementing their strategies. As information centers expand and become more closely tied to central MIS, end users need the ability to produce applications that support large numbers of users. The increasing power of personal computers is challenging software vendors to offer products such as full-function fourth-generation languages to satisfy end users.

Both companies contend that fourth-generation languages are being accepted in mainstream DP environments for developing production applications, not just ad hoc reporting or one-time applications. Richard Cobb, former president of Mathematics and now head of Martin Marietta's Information Technology Division and the acknowledged founder of nonprocedural languages, told Ramis II users at a recent meeting in Washington, D.C., that 95% of IBM sites are expected to have a fourth-generation language installed by 1989.

Martin Marietta research on how fourth-generation languages are used shows that 68% of users employ their

See LANGUAGE page 31

Programming teams: On the way out?

By Edward Warner
CW Staff

CHICAGO — Large programming teams composed of dozens of workers will in 10 years go the way of the steam engine and the nickel cigar, according to Nicholas J. Marselos, a consultant in AT&T's Network Software Center.

Marselos presented his thesis — that "programming teams are on the way out" — in a panel discussion on the future of programming teams at the recent 1985 National Computer Conference here. Software teams are threatened, Marselos explained, because of rising labor costs and the existence of fourth-generation languages that automate the production of code.

The situation, he observed, is analogous to that faced by the American auto industry. If automation advances, such as robots, are going to be used to produce cars because of high labor costs, "I say we are headed to where the robots manufacture software," Marselos said.

See TEAMS page 31

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Litton, MSA ink accounting software marketing pact

WOODLAND HILLS, Calif. — Litton Computer Services has reached an agreement with Management Science America, Inc. (MSA) to market MSA's line of accounting software to Litton's remote computer services customers.

According to a spokesman, Litton will maintain most of the MSA product line, including accounts payable and receivable systems, fixed assets accounting, general ledger, purchasing, payroll/personnel, facilities for micro-mainframe links and MSA's Information Expert system.

Litton said it expects the MSA products to be available by the end of the year. Users will have two payment options: a base charge plus a 30% royalty or a one-time fee based on the client company's annual revenue. Companies with $20 million or less in revenue pay a 5% license fee, companies with $50 million or less in revenue pay a 10% fee, and companies with more than $50 million in revenue pay a 15% fee. Users who buy the MSA software outright would pay approximately $1 million.

Litton Computer Services, part of the Mellonics Systems Development division of Litton Systems, Inc., operates data centers in the New York, Los Angeles and Washington, D.C. areas.

Litton Computer Services can be reached through P.O. Box 4040, Woodland Hills, Calif. 91365.

Martin Marietta introduces optional Ramis II interfaces

PRINCETON, N.J. — Martin Marietta Data Systems has announced optional Ramis II interfaces to IBM's DB2 and SQL/DS data bases. Ramis II is Martin Marietta's fourth-generation language.

A spokesman said that the interfaces facilitate the automatic conversion of Ramis II nonprocedural requests into SQL commands. As with other Ramis II external file interfaces, identical Ramis II commands are used regardless of the data source. Initially, Ramis II support for DB2 and SQL/DS provides report generation, graphics and relational capabilities.

The DB2 and SQL/DS interfaces feature the following: automatically built dynamic SQL requests that prevent unexpected full file searches; a menu-assisted facility that extracts a table description from the DB2 or SQL/DS catalog where authorized, automatically generates an equivalent Ramis II external file description and permits modification to the description; and all Ramis II data analysis capabilities.

The Ramis II DB2 and SQL/DS interfaces will be available in September. Prices will range from $3,375 to $6,750, depending on host CPU.

Martin Marietta Data Systems, a branch of Martin Marietta Corp.'s Information Technology Division, can be reached through P.O. Box 2392, Princeton, N.J. 08540.

IBM systems monitor debuts

DAYTON, Ohio — Shopsmith, Inc. has announced Shopmon, a performance monitor for IBM and IBM-compatible MVS systems.

Shopmon uses cross-memory services to provide wait analysis, address space analysis, disk and tape analysis and systems analysis, including CPU plots, real storage usage, paging and swapping and master console support, according to the vendor.

With the product's optional interface to Cullinet Software, Inc.'s IDMS data base management system, Shopmon can gather information from the address space where IDMS is executing without signing on to IDMS. Active tasks, systems statistics and data base statistics can be viewed on-line and in real time.

Shopmon provides visual access to all areas available through the use of standard IDMS commands for data base areas, storage pools, program and reentrant pools, program definitions, memory displays and IDMS region maps.

Shopmon for MVS is priced at $15,500, and the IDMS interface is priced at $6,500, according to the vendor.

Additional information is available from Shopsmith, which is located at 6640 Poe Ave., Dayton, Ohio 45414.

Decision support tool bows

GREENBELT, Md. — Martin Marietta Data Systems has announced MAS-Decision Maker, software that provides decision support capabilities for the company's MAS-Manufacturing System software. The product runs in IBM's MVS and DOS/VSE environments.

MAS-Decision Maker runs with the company's MAS data bases, written in the former Mathematica Products Groups, Inc.'s Ramis II fourth-generation language. MAS-Decision Maker is said to aid non-DP professionals in solving problems, answering ad hoc questions and anticipating changes on the shop floor without technical assistance.

MAS-Decision Maker is available for use with the six modules of MAS-Manufacturing, including the following: master production scheduling, inventory control, cost control, manufacturing control, engineering control and purchasing. The product will be integrated into all of Martin Marietta Data Systems' IBM-based MAS applications software products, including MAS-Financials, MAS-Payroll, MAS-Personnel and MAS-Material Lot Tracking.

MAS-Decision Maker is priced at $30,000.

Martin Marietta Data Systems is located at 6303 Ivy Lane, Greenbelt, Md. 20770.

SYSTEMS SOFTWARE

■ **Advanced Systems Concepts, Inc. has announced that its Status/38 resource accounting aid for the IBM System/38 has been enhanced with IBM's CPF operating system accounting code and the ability to produce invoices for chargebacks to user departments.**

Status/38 now runs independently of the system history file by making use of CPF journaling facilities. The product provides inquiries, reports, graphs and charts of data accumulated by itself and the CPF operating system.

The chargeback system, which allows users to be billed for use of system resources, allows variable rates based on job name and type. A series of fixed charges can be included, and charges can also be shared between several groups or individual jobs.

Status is available for a one-time fee of $1,500.

Advanced Systems Concepts, Suite S, 1350 Remington Road, Schaumburg, Ill. 60195.

Uptime

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CICS Dynamic File Allocation is a must for effective CICS scheduling. It is the gateway to non-stop, round-the-clock CICS systems. It eliminates batch update constraints. It guarantees bullet proof restarts. It allows you and your batch jobs to add and remove CICS files at will, without disrupting your user community. Site license $4,000.

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Netec International, Inc.
P.O. Box 18538 • Dallas, TX 75218
214 324-3946 • Telex 88-4294

■ **Morino Associates, Inc. has announced the Mics Mazdamon Component for the MVS Integrated Control System network management product line. Mics Mazdamon Component runs in IBM MVS environments.**

The product supports Mazdamon, the Vtam network monitor developed by Mazda Computer Corp. of Ontario, Canada. The data summarization and processing capabilities of Mics allows users to summarize network data to the degree required for analysis. The product also provides access to high-volume network data.

The Mics data validation process is said to ensure the integrity of network data. Support of Mazdamon by the Mics Installation Accounting Component permits billing of network resources at the user and terminal level for IBM TSO sessions and at the terminal level for other interactive sessions. Mics Mazdamon data can also be used for network capacity planning.

Mics Mazdamon Component is priced at $3,900 for the initial year and $1,300 for the first renewal year. The standard license fee for the prerequisite Mics base set is $37,900 for the initial year and $9,800 for the first renewal year.

Morino Associates, 8615 Westwood Center Drive, Vienna, Va. 22180.

■ **Lawson Associates, Inc. has announced Access/38 and Access/DB systems software for IBM System/38 users.**

Access/38 allows users to define and execute their own on-line inquiries and to generate reports using standard System/38 data. Access/DB enables data processing professionals to create on-line interactive RPG-III programs allowing for additions, changes and deletions to the data base.

According to a spokesman, the two modules may be used separately or together, with Lawson and other types of software.

The Access/38 module is priced at $9,000, and the Access/DB module is priced at $4,000.

Lawson Associates, 2021 E. Hennepin Ave., Minneapolis, Minn. 55413.

APPLICATION PACKAGES

■ **Trax Softworks, Inc. has introduced Version 3 of its Electronic Spread Sheet (ESS) for IBM mainframes under IBM's VM/CMS and MVS/TSO.**

ESS Version 3 allows users to create a three-dimensional spreadsheet. Pages have been added and the spreadsheet size extends to the virtual storage on the IBM system, the vendor said.

ESS now includes a natural recal-

Continued on page 25

SOFTWARE & SERVICES

Continued from page 24

culation capability. The product can determine the order for recalculating the spreadsheet by analyzing the references in each formula, the vendor said.

ESS Version 3 is priced at $12,000.

Trax Softworks, 10801 National Blvd., Los Angeles, Calif. 90064.

■ **Tower Systems International, Inc. has announced Release 5.3 of Omnicalc, its electronic spreadsheet for IBM mainframes. The product runs in IBM's VM/CICS, VM/CMS and MVS/TSO operating environments.**

Release 5.3 features menu prompting for all spreadsheet commands. The feature allows for the execution of all Omnicalc commands from the menu. On-line Help screens are said to enable users to create spreadsheets without having to study the manual and memorize commands. The spreadsheet menu facility uses the same tree structure as Lotus Development Corp.'s 1-2-3 spreadsheet program.

Release 5.3 of Omnicalc also has enhanced its command structure to include cell range execution for most commands. Cell ranges can span through two or three dimensions. Release 5.3 allows a spreadsheet size of 255 columns, 32,767 rows and 25 planes.

Other features include three-dimensional modeling, multiple spreadsheet consolidation and on-line Help files.

For a two-year lease, Omnicalc 5.3 for CICS and CMS is priced at $1,995 each year; the TSO version is priced at $1,995 for both years.

Tower Systems, 19782 MacArthur Blvd., Irvine, Calif. 92715.

■ **Visual Engineering, Inc., has introducted three-dimensional scene modeling software for Digital Equipments Corp. VAX and Pyramid Technology Corp. superminicomputers running under the AT&T Unix operating system.**

Visual:Genisys includes a hierarchical data base and simulated camera and lighting control facilities. A rendering package allows 3D objects and scenes to be generated from 3D data, the vendor said.

Ray-traced images can be produced in constant time, and images can be computed using less powerful minicomputers or workstations. Visual:Genisys also offers wireframe, facet-shaded and smooth-shaded rendering styles.

Visual:Genisys is priced from $10,000 to $75,000, depending on configuration.

Visual Engineering, Suite 200, 2680 N. First St., San Jose, Calif. 95134.

■ **Mass Systems Co. has announced a Lumber and Building Materials Distribution Management (LBM/DM) system for the IBM System/36 and the recently introduced System/36 Personal Computer.**

LBM/DM is designed for wholesalers and retailers of building materials and lumber. The LBM/DM comes with five modules: order entry, billing, inventory control, accounts receivable and sales analysis. The product includes point-of-sale support, such as price quotations, credit control capabilities and units of measure facilities. LBM/DM is priced at $10,000 for the System/36 Personal Computer and $16,000 for the System/36.

Mass Systems, 28 Edgehill Road, Waltham, Mass. 02154.

■ **Signal Technology, Inc. has announced Version 4 of its Smartstar development and information management software for Digital Equipment Corp. VAX processors.**

Smartstar Version 4 includes a Relational Query Processor interface to VAX RMS files. Smartstar consists of two components. The first component contains an application design interface, a data updating and retrieval interface and a general report writer. The second consists of Smartcall, which allows users to integrate screen-driven processes into applications, and Opal, an interface for relational queries and reporting to RMS and RDB files.

Smartstar options include Request, a relational report and query system for a nonprocedural Interactive Query Language. Request supports RMS file access and RDB/VMS relational data base access. Smartstar is priced from $3,500 for the Microvax to $25,000 for the VAX 8600.

Signal Technology, 5951 Encina Road, Goleta, Calif. 93117.

■ **Superset, Inc. has announced Postraster, a graphics image postprocessor, for its Professional Graphics Mainframe workstation.**

Postraster allows the user to produce special effects design work automatically. A color averaging feature controls components of the raster or pixels to create stylized graphics.

Other capabilities include texturing, overlay, image insertion, edge detection and nonproportional text and image scaling, the vendor said.

Postraster is priced at $3,000 until September 1.

Superset, 11025 Roselle St., San Diego, Calif. 91921.

■ **Gateway Design Automation Corp. and Elxsi International have announced a parallel processing version of Gateway's Aidesim concurrent fault simulation program for the Elxsi System 6400 multiprocessors.**

Aidesim-A operates on up to 10 processors and is said to provide an increase in processing speed. Aidesim-A is supported by up to 192M bytes of physical memory and provides speed and capacity for fault simulation of logic networks of more than one million gates.

Aidesim-A is priced from $100,000 for one CPU up to $350,000 for 10 CPUs.

Gateway Design Automation, 235 Great Road, Littleton, Mass. 01460.

■ **The Wheatley Group, Ltd. has announced an applications package for reinsurance companies that provides on-line calculation for reinsurance policies.**

Wins-RE for the IBM System/38 includes capabilities for processing claims, contract syndicates, quota share and treaty abstracts. The package includes on-line update and ad hoc reporting facilities. The system can calculate reinsurance, retrocession, reinstatement and conduct automatic currency conversions on-line, the vendor said.

Wins-RE is priced at $175,000.

The Wheatley Group, One Huntington Quadrangle, Melville, N.Y. 11747.

■ **J. L. Ham & Associates, Inc. has announced Release 3 of its Fixed Asset Control One System for the IBM System/38.**

According to a spokesman, features in Release 3 include expanded asset identification fields, a restructured calculation cycle, support for additional levels of totals, facilities to consolidate reporting from multiple companies, support for recording and reporting of asset transers and an additional set of reference fields.

Release 3 of the Fixed Asset Control One System is priced at $5,000 per CPU, including source code.

J. L. Ham & Associates, Maple Professional Building, 693 Maple St., Plymouth, Mich. 48170.

■ **Gary Brown Associates, Inc. has announced an on-line Accounts Receivable Management System (Arms/OL) for the IBM System/36.**

Arms/OL includes support for up to 999 divisions. A System Control File permits the specification of divisions, receivable classes and statement messages. Users can customize discount information and incorporate late charge restrictions and percentages and aging criteria for customers through a customer master file. The package allows credit memos to be posted to invoices by the system or by the user. Other features include monthly or daily late-charge posting and the ability to interface with invoicing systems through a batch-post input file.

Arms/OL costs $3,500.

Gary Brown Associates, Suite 2, 323-B Edwardia Drive, Greensboro, N.C. 27409.

■ **Caricor, Inc. has announced that its CDA-5000 software now runs on Data General Corp.'s Distributed Systems engineering workstations.**

Also available on a variety of workstations, including systems from Apollo Computer, Inc., Sun Microsystems, Inc. and Masscomp, the CDA-5000 software is a design automation package that can be used to create and simulate the operation of schematic diagrams.

Design functions include interactive logic design and simulation and design capture, which can be performed with menus, mouse controls and windowing functions.

The Caricor CDA-5000 products are priced from $15,000 to $19,900, depending on configuration.

Caricor, Lakeside Plaza One, 5225 Wiley Post Way, Salt Lake City, Utah, 84116.

■ **Ross Systems, Inc. has introduced a fixed asset tracking and accounting control package for Digital Equipment Corp.'s VAX processors.**

Maps/FA provides accounting control of acquisitions, maintenance and transfer and retirement of corporate assets, the vendor said. The product includes four depreciation methods and pro rata convention capabilities. Maps/FA can be

Continued on page 36

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SOFTWARE & SERVICES

Continued from page 25

modified in accordance with changing business and regulatory requirements.

Maps/FA can be integrated with other Ross application packages, including its general ledger. By validating entries through Maps/GL, calculations and period-end depreciation entries are automatically posted. Pricing for Maps/FA ranges from $11,000 to $21,500, depending on the VAX model.

Ross Systems, Suite 210, 1860 Embarcadero Road, Palo Alto, Calif. 94303.

■ Xerox Computer Services, Inc. has announced Version 3 of its Accounts Payable system for the IBM 4300 series mainframes.

The enhanced version features expanded invoice entry and control options, an added invoice history file, improvements in batch numbering and the ability to identify accounts by purchase order number. The product also includes the ability to calculate due dates and discounts, the vendor said.

Accounts Payable Version 3 is priced at $25,000.

Xerox Computer Services, 5310 Beethoven St., Los Angeles, Calif. 90066.

■ Mentor Graphics Corp. has introduced simulation tools for use with its Idea series of engineering workstations for computer-aided engineering.

The Quicksim products allow users to perform logic and fault simulation and timing analysis from one application interface, the vendor said.

Quicksim for Logic Simulation gives users 12-state simulation capabilities. Simulation support includes 95 classes of models as well as the Mentor Graphics Hardware Modeling Library and Behavioral Language Models. It is priced at $14,500, according to the vendor.

Quickfault includes a concurrent algorithm that provides fault analysis and graphic display of fault detection as well as undetected faults and fault blockages. It is priced at $16,500.

Quicktime provides capabilities for worst-case timing modeling functions and allows users to incorporate the same display format as other Quicksim functions. Quicktime costs $14,500.

Mentor Graphics, 8500 S.W. Creekside Place, Beaverton, Ore. 97005.

■ Informatics General Corp. has introduced a Word Processing Interface (WPI) for use with its Basis data base management system on Wang Laboratories, Inc. VS systems.

Basis WPI, designed for use by law firms and corporate legal departments using Wang's word processing systems, allows documents compiled on the Wang system to be loaded into user-selected data bases. Word processing files that have been converted to data base files can also be retrieved and converted back into document form.

Basis WPI costs $15,000. The Basis data base management system is priced at $70,000.

Informatics, 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

■ Tom Software, Inc. has announced that its line of accounting and vertical market business software now runs on Digital Equipment Corp.'s Microvax II.

The company also announced that its Tombasic Basic II language interpreter will run under DEC's Ultrix operating system.

Tom Software, 127 S.W. 156th St., Seattle, Wash. 98166.

■ Intergraph Corp. has introduced the Robot Modeling and Programming System for its Digital Equipment Corp. VAX-based computer graphics system.

According to the vendor, the product can be fully integrated with Intergraph software and includes project management capabilities as well as graphics libraries that allow users to link descriptive information and engineering data to individual components.

The software can solicit and store information, including the robot's coordinate system, motion type and degree of freedom. The Robot Modeling and Programming system costs $30,000.

Intergraph, One Madison Industrial Park, Huntsville, Ala. 35807.

■ Vertex Information, Inc. has announced Release 2 of Harvey, its online health insurance claims processing system for use under IBM's DOS/VSE operating system.

A flexible option file, extended claims processing capabilities and additional inquiry screens have been added to the release, the vendor said. Harvey 2 is written in Cobol and runs on IBM 4300 series mainframes running CICS.

Price of the product including source code ranges from $60,000 to $180,000.

Vertex Information, 2205 Fortune Drive, San Jose, Calif. 95131.

■ CAE Systems, Inc., a division of Tektronix, Inc., announced that its computer-aided engineering (CAE) design software is now available for Digital Equipment Corp.'s Microvax II.

CAE 2000 VAX/VMS is a hierarchical software system that incorporates schematic capture, logic and circuit simulation capabilities, the vendor said.

Prices begin at $16,000.

Tektronix, 1333 Bordeaux Drive, Sunnyvale, Calif. 94089.

See TOOLS page 31

You could win $1000 in the first international computer-generated art contest

CW Communications, Inc. — the world's leading publisher of computer-related newspapers and magazines — is proud to announce its sponsorship of the very first international computer-generated art contest.

All entries must be computer-generated, mounted, and suitable for display. Entries will be judged primarily on their artistic merit, but execution will also be taken into account. Two prizes will be awarded. The winning individual will receive $1,000 (U.S.). The winning organization will receive a trophy.

Winners will be announced during the First Pan Pacific Computer Conference (in Melbourne, Australia, this September 10-13). All entries will be put on display in a special exhibit at this conference.

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InfoCalc, our integrated spreadsheet, lets managers access information from the department across the country as easily as the sales office from across the corridor.

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No word processing vendor can integrate the extensive array of data processing products you'll find with The Honeywell Office.

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Unlike competitors who require mainframes for network control, we aren't limited to creating star networks. Our ISO based Distributed Systems Architecture (DSA), gives you the flexibility to configure ring, mesh, peer-to-peer, and other styles of networks.

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TOOLS

from page 26

■ **Independent Computer Systems, Inc. has announced the ICS Inventory Management system for the Honeywell, Inc. DPS 6 minicomputer.**

ICS is an on-line, menu-driven application aimed at allowing non-data-processing users to manage and control inventory information, a spokesman said. The package assists in recording inventory movements and balancing carrying costs with the stock necessary to service internal or customer orders.

In the ICS system, inventory information is retained at the inventory item, location and detail transaction levels. The system supports various costing methods, including standard, average, last-in, first-out and first-in, first-out methods.

Optional interfaces to the ICS Order Entry, Purchase Orders, General Ledger and Preventative Maintenance Systems are supported.

The ICS Inventory Management system costs $14,500.

Independent Computer Systems, Suite A-201, 10640 N. 28th Drive, Phoenix, Ariz. 85029.

■ **Mentor Graphics Corp. has enhanced the logic and fault simulators within the Quicksim family of simulation tools for its Idea series of engineering workstations.**

The Quicksim packages offer design engineers logic and fault simulation, as well as worst-case timing analysis. The packages include the Quicksim logic simulation package, the Quickfault interactive fault simulation package and the Quicktime timing analysis package.

Quicksim provides interactivity of stimulus and probes and 12-state simulation for accurate MOS verification. Mixed-mode simulation allows switch, gate, functional, behavioral and physical models to be used by the simulator.

Quickfault's concurrent algorithm provides fault analysis and a graphical display of cumulative fault detection, undetected faults and fault blockages. Quicktime provides worst-case timing and timing using the same stimulus and-display formats as all Quicksim family functions.

Customers who have Mentor Graphics' logic and simulation package will receive free upgrades. Upgrade options for the Design Station, including Quicksim logic simulator and Quicktime timing analysis, cost $14,500.

Quickfault fault simulation upgrades for the Idea workstation cost $16,500. All the Quicksim family products are scheduled for August availability.

Mentor Graphics, 10200 S.W. Nimbus Ave., G7, Portland, Ore. 97223.

LANGUAGE

from page 23

fourth-generation language for ad hoc reporting, 67% use it for applications development by professionals, 53% use it for applications development by end users, 46% use it for information center purposes and 37% use it for decision support. Accounting, marketing, sales and personnel departments all employ the product, the company claimed.

But the major stumbling block to making Ramis II useful for production environments, according to users interviewed at the meeting, is the product's inability to support concurrent data base updates. The limitation makes use of Ramis II in large shops impractical. Aware that the restriction is hindering Ramis II's growth, the company promised an updated Data Base Manager for Ramis II, for fourth-quarter delivery, that supports concurrent updating.

Admitting past failures to meet certain deadlines, Martin Marietta adopted an apologetic stance at the users group meeting and promised to improve. "We are hopeful that problem is behind us. We're better organized and have increased staffing," Cobb said.

At Software AG's users group meeting in Nashville, Chairman of the Board John Maguire said, "More and more of our new products are moving into end-user areas." The big announcement at the meeting, the alliance of Software AG and Ashton-Tate, backed up that direction. The alliance is expected to tie Software AG's Natural/Connection micro-mainframe link and Ashton-Tate's Dbase II data base management system and Framework spreadsheet products.

Software AG's long-term strategy outlined by Maguire — a familiar one in the industry — is to provide "one-stop shopping for all software and information services needs." To be implemented over five years, the strategy will involve office systems, third-party agreements and customized applications.

From its established position in the MIS world with the Adabas data base management system, Software AG Executive Vice-President Peter Page argued that Software AG has an advantage in extending to end users, such as in offices. Stuart Miller, president and chief executive officer of Software AG, said the shift toward end-user computing is a natural one for the company. "People who've used our products have always been MIS people, technical people. But as the technology has advanced, and the availability of more comprehensive tools for end users has increased, this is a more appropriate direction for us to take," he said.

Which company is in the better position? Users would do well to compare their own needs with the traditional strengths of each product.

TEAMS

from page 23

To build a programming team that works well together, Marselos advised his listeners to do the following:

■ Provide team management that is neither too domineering nor too passive. To lean in the former direction will make the team too dependent, to bow to the latter will create a team with too many chiefs, he said.

■ Never give awards to only one team member. If the entire team does not share successes, individual rivalries will arise.

■ Choose team members who are competent but who do not aspire to superstar status. Programming superstars can be too individualistic, he said.

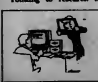
■ While teams composed of dozens of programmers will fade away, the small, specialized programming team will remain, Marselos predicted. The small teams, he added, will be composed of a few highly skilled programmers who will work with sophisticated development tools to produce applications that are too complex to be created through automation advances.

While he did not agree with Marselos' prediction of a limited, 10-year life expectancy for the programming team, co-panelist Prof. J. Daniel Couger, distinguished professor of computer and management science at the University of Colorado, noted that computer professionals' personalities make them unlikely candidates for membership in a team of any sort.

Pointing to research he conducted on what motivates computer professionals, Couger reported that computer professionals have a high need for career advancement and challenging work and a low need for social interaction on the job.

The need for growth, he elaborated, means that "they want measurement of their own progress. The ambiguity that occurs [in a group] is sometimes distasteful to them," he said.

Personality issues are one of the reasons that work groups will become an endangered species, Marselos elaborated. Often the wrong people — people who are too aggressive or with skill levels that are too low — are chosen for team membership. "The whole human relationship system is often forgotten in team building," he said.



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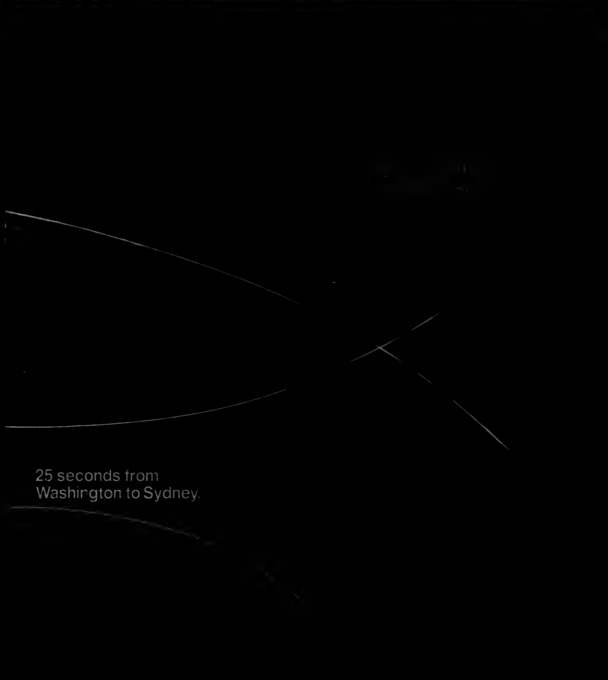

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SEARS

from page 23

"It was very natural for us to look at Disoss," specifically Disoss Version 3 Release 2, Weis said. Sears runs four copies of the product, two in the Sears Merchandise group. "With the architecture we have in place today, we can decide to run additional copies of Disoss if the network volume reaches a point where that's a good economic trade-off," Weis said.

The combined companies have more than 2,000 enrolled Disoss users. Of those, more than 700 are also users of Profs. Other external users, who are not enrolled with identifications on Disoss, are bridged to Disoss via custom interfaces.

Products the company supports with Disoss include the IBM Displaywriter, the 5520 Administrative System and 8100/Distributed Office Support Facility systems. The network supports approximately 215,000 Disoss transactions per month and has 45,000 documents stored in Disoss libraries.

Sears uses IBM's Application Program Interface (API), a tool provided with Disoss, to build bridges from Disoss to other programs or applications such as Profs.

API allows users to author CICS transactions such as those for fetching a document from a library, storing a document in a library and distributing a document.

Sears also uses API to link Disoss with an internal communications subsystem, dubbed Senden, used to send messages and collect and transmit data in bulk. The company has more than 6,000 Senden users, with many different types of hardware.

> *'The general reaction with the business groups that have installed the product has been favorable.'*
>
> — Gerard R. Weis
> Sears Communications
> Network, Inc.

Weis said he plans to install Disoss 3.3 at Sears Communications when it becomes available, but he is not sure the IBM-coded connection between Profs and Disoss that the release would provide will meet all his requirements. He noted that the ability to send revisable text between Profs and Disoss is not being offered in the release.

For the future, Weis hopes IBM will offer Personal Computer/LU6.2 SNA support, improved systems utilities, cross-systems usability such as the Profs-Disoss link, a workstation strategy and a focus on strategic subsystems such as System/36.

A key consideration for companies considering widespread Disoss implementation is user training, Weis said.

"It is clearly a complex product, and it takes the right level of technical skills to install. All the business groups have found it requires an effort to train the users and enforce the discipline within their groups to effectively use the [Disoss] functions. There is no substitute for adequately planning" the implementation of Disoss, Weis said.

Characterizing his company's experience with Disoss, Weis said, "The general reaction with the business groups that have installed the product has been favorable. I think the resources it consumes are reasonable for the work people are getting done with it. Except for the usual types of problems you have with products, it's been a positive experience."

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*LAN Benchmark Report, May, 1985, Novell, Inc. and "Software, Not Hardware Key to LAN Performance," *PC Week* 1/15/85.

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MICROCOMPUTERS

Notes from a quiet NCC '85

SMALL TALK
Eric Bender
CW Senior Editor

Although any National Computer Conference (NCC) can generally be described as a bear of a show, this year's version was more like a giant sloth — big, slow and sleepy.

The busiest booth at Chicago's McCormick Place — IBM's — did not showcase any new products, and frequently, the action on the floor seemed as lazy as the sailboats idly tacking on the blue waters of Lake Michigan just outside.

Most major microcomputer hardware and software vendors were conspicuous by their absence.

Some interesting products — such as Plus Development Corp.'s Hardcard, a 10M-byte hard disk drive on an IBM Personal Computer expansion card — made their first appearance at a major trade show, and some significant communications products debuted, but that was about it.

The following are some notes and quotes from the Second City's latest NCC:

- "We expect to see prices of MS-DOS computers drop below $1,000 in the next year to year-and-a-half," accelerating the move toward local-area networks, said Eileen Easterbrook, Software Publishing Corp.'s product manager for new products.

Like other microcomputer software vendors, Software Publishing "is in the process of getting [its] ducks in a row" on network applications, with the most difficult questions centering on pricing. The company intends to emphasize technical rather than legal safeguards in future site license deals.

"We're not interested in contractual arrangements and enforcement, we're interested in shipping products," Easterbrook commented.

- David Melin, Microsoft Corp.'s product manager for MS-DOS 3.1 and Microsoft Networks, cautioned against expecting a "messiah-type product" such as [Lotus Development Corp.'s] Visicalc for networks. He also noted that plummeting costs of peripherals have

See SMALL page 51

- Digital Communications Associates' new Smart Alec product links IBM Personal Computers with System/34, 36 and 38 midrange machines/44
- NEC Information Systems has introduced a local-area network, a 20M-byte hard disk and other products for use with its personal computers/44
- Analytica has dropped the copy protection on its Reflex software and will offer site licenses/46
- 3Com has announced the 3Server70, a high-end server for the firm's personal computer local-area networks/46

INSIDE
Systems/46
Printers/Plotters/53
Board-Level Devices/51

High-quality graphics devices land on desktops

Price drops aid spread of laser, ink-jet printers

By Edward Warner
CW Staff

Personal computer graphics users can expect 1986 to be the year that high-quality output devices, including laser and ink-jet printers, become inexpensive enough to be used on desktops, said graphics industry analyst Alan Paller in a presentation earlier this month at the National Computer Conference.

The accessibility of high-quality output, added Neil Kleinman, president of Pacific Technology Associates, will make the use of graphics for reports and meetings the dominant use of graphics within two years. Kleinman, a fellow industry analyst who spoke at that session, said that personal computer graphics currently are rarely used for reports and presentations because of low quality.

That will change, however, as desktop laser printers come into wider use, said Paller, the president of AUI Data Graphics/Issco in Arlington, Va. Driving the spread of laser printers, he predicted, will be continuing price reductions — some now cost as little as $3,000 — and the fact that most computer graphics are reproduced onto paper. At present, paper is the medium chosen for output by 60% of graphics users, he said, adding that "I believe that is a figure that will go up. We're a paper society."

Laser printers will likely be bought for their ability to reproduce high-quality text, he explained, but once the laser printers are purchased, "it will be such a small, marginal cost to [output] graphics" that users will reproduce both text and graphics using them. Paller acknowledged that software that integrates both text and graphics currently causes a laser printer to run slowly, but, he added, that hurdle will be overcome as graphics software vendors recognize the spread of laser printers and enhance their products for greater speed.

Another output device set to make big strides in price and performance, Paller observed, is the ink-jet printer. Currently, he noted, one vendor, Hitachi Ltd., offers

See GRAPHICS page 51

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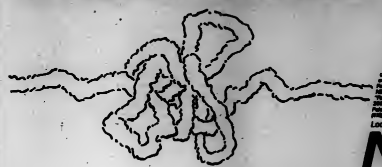

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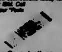

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Choices limited for micro natural language interfaces

By Eric Bender
CW Staff

CHICAGO — "As micros proliferate, there are more and more people who need to access data bases without programming," but there is almost no choice among commercial products that meet this need, according to Martha Evens, a researcher with the Illinois Institute of Technology.

Evens, who chaired a session earlier this month at the National Computer Conference said that, among software vendors, "the cast of characters in this area is changing as quickly as the technology," with many firms apparently putting the brakes on their development efforts.

Among these, Evens mentioned Artificial Intelligence Corp., a vendor with a successful track record in natural language on mainframes. Last fall, the firm was enthusiastic about taking part in the session, but it canceled plans to participate after putting its micro project on the back burner. She also noted that one high-profile start-up, Symantec, Inc., has failed so far to deliver a commercial product.

The session, titled "Microcomputer Data Bases That Understand English," did feature a discussion of one natural language project that Evens described as highly promising. Frederick Thompson of the California Institute of Technology described the effort to move the Natural Access System software — developed by himself and his wife, computer linguist Bozena Thompson — from larger machines down to an IBM Personal Computer AT.

As Thompson outlined it, Natural Access System is a large and ambitious software system designed to integrate a natural language interface with text, graphics and image processing and to allow flexible extensions by end users and programmers.

The system has been compiled to approximately 1M byte of Pascal-code and is being ported to a Personal Computer AT with 640K bytes of internal memory through the use of an elaborate paging scheme tightly linked to the language processing, Thompson said. The version currently is being beta tested and will be demonstrated publicly in September.

Running on Motorola, Inc. 68000-based systems, Natural Access System software has demonstrated performance "that is very reasonable in terms of human response," with answers to some queries available in 3 or 4 seconds, Thompson said. Work to date suggests that use of the AT will cut response time by about one third, he added.

Thompson discarded the suggestion that the program falls under the heading of artificial intelligence. "We don't see ourselves as a part" of the artificial intelligence community, he said.

Erickson discusses Clout

Also at the session, Wayne Erickson, Microrim, Inc. chairman, discussed his firm's Clout software, a natural language package whose artificial intelligence capabilities were heavily promoted during its introduction last year. Erickson commented that some relatively simple features, such as a spelling checker, turned out to have a high payoff. "Little things like that can be really important to reduce the level of frustration," he said.

Another important feature is to let the user know, during a lengthy query, that the machine is still working on the request. "When people ask questions in natural language, they always expect to see the answer come back instantly," Erickson pointed out, so a screen display showing progress on the request is appreciated.

Erickson noted that many users would like to be able to update their data bases through a natural language interface. However, he pointed out that "updates have to be done with a lot more care" than queries in order to safeguard the data base's integrity. Additionally, he said, such queries might overload a micro's memory and processing capabilities.

Asked why there are so few choices in microcomputer natural language interfaces, Erickson responded that "natural language is nontrivial software." Most natural language systems, written in traditional AI languages such as Lisp and Prolog "end up requiring more resources than the [micro] has," he added. "We used Fortran and developed a lot of techniques to shoehorn our software into the [micro]."

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The time has come for straight talk about database management systems.

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Throughout the history of the software industry, proponents of one database architecture after another have promoted their respective systems as the sole solution to a company's application backlog problem.

The early debate centered on hierarchical versus network architecture. Advocates of inverted file entered the argument in the 70's. And today, relational is the architecture of choice.

While this discussion about architecture is interesting, it's just not the issue. Database management systems, beginning with the very first, were created to do one thing and one thing only—they were created to build better applications. *Building applications—efficient, online applications, faster, with fewer people—is the only real issue.*

Today corporations have a huge backlog to contend with. And the applications they need to develop have different characteristics. Some may be retrieval only. Some may be heavy on update. Some will run the company, and will require professional development. Some can be created by end users to satisfy their own needs.

It is extremely important to have a database management system that can handle all applications. *It is essential* that a database include tools rich and comprehensive enough to accommodate both the professional developer and the end user. It's the richness and power of these tools that's critical to the successful implementation of highly responsive fourth generation applications. What's demanded, in fact, is software that goes a *step beyond* today's conventional relational database systems.

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In Cullinet's new Annual Report, Presidents and CEO's of major corporations speak about the positive impact Cullinet has had on their operations. For a copy that you might like to read and pass along to your company president, write to me. I'll see that you get one.

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The only database management system worth buying is one that meets these six requirements.

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Net, disk drive, board top NEC micro line additions

BOXBORO, Mass. — NEC Information Systems, Inc. has announced a local-area network, an external 20M-byte hard disk drive and the Software Library Expander, all for use with machines in its Advanced Personal Computer line.

It has also introduced two new printers and a product that reportedly provides color printing of output from an Apple Computer, Inc. Macintosh.

The Vianet local net reportedly supports up to 64 personal computers, peripherals and telecommunications devices communicating over twisted-pair wiring at a cost of $525 per node. The local-area network, a peer-to-peer network, handles all command interpretation, message routing, data formatting and error checking between the application program, the operating system and the local net protocol. Vianet is said to offer record locking but does not require a dedicated disk or file server station.

The 20M-byte, 5¼-in. hard disk, meanwhile, was introduced for use as a peripheral to the NEC Advanced Personal Computer (APC) III. Also announced for the APC III was the Software Library Expander, which reportedly permits users to run such software as Lotus Development Corp.'s 1-2-3 spreadsheet and Ashton-Tate's Dbase III. The Software Library Expander consists of a plug-in circuit board, software and documentation.

The new printers include the NEC Spinwriter, e.l.f. 350 for use with IBM Personal Computers and compatibles. The unit reportedly provides printing at up to 190 word/min. Also introduced was the Pinwriter Model P5, a dot matrix printer that reportedly operates at 53 db and offers letter-quality printing at 190 char./sec. and draft quality at 220 to 290 char./sec.

Also introduced was the Colormate software package for the Macintosh, a product that reportedly allows users to print in eight different colors. To print in color with Colorwriter, users need a NEC Pinwriter Model P3-6, P5-6, CP-2 or CP-3, priced at $785, $1,085, $1,085 and $1,485, respectively.

Vianet costs $525 for each interface board. The Software Library Expander is $150. The 20M-byte disk is priced starting at $1,495, without a controller. The Pinwriter Model P5 costs $1,445 and the e.l.f. 350 is priced at $545. Colorwriter consists of a diskette, interface cable and documentation and is priced at $99.

NEC Information Systems is located at 1414 Massachusetts Ave., Boxboro, Mass. 01719.

Picking knowledge systems

High-payoff, low-risk applications ideal

By Eric Bender
CW Staff

CHICAGO — Getting started with knowledge systems "is not that tough, but it's not that easy either," according to John Spencer, vice-president for marketing and sales at Teknowledge, Inc., a knowledge systems software vendor.

Speaking here earlier this month at a National Computer Conference session on personal computer-based artificial intelligence, Spencer listed several recommendations for companies studying the potential payoffs of knowledge systems.

Heading the list, he said, is picking suitable early candidates for knowledge systems, and companies should look for high-payoff and low-risk applications.

"Don't pick some project that's going to take two years to pay off, because management will get very impatient," Spencer advised. He noted that most Teknowledge customers currently are building knowledge systems for tasks where there is a single correct answer rather than a range of responses.

Another important point, Spencer said, is "when you get into a jam, use some outside resources." He also suggested that companies focus on applying technology rather than developing it and to "expect that opportunities will far exceed your ability to respond."

Spencer added that "we spend a lot of time with people on what we call 'expectation management.' " For example, he said, Teknowledge cautions customers against expecting a system to be right 100% of the time, just as a human expert is not always right.

Another session panelist, Wanda Rappaport, director of software sales and marketing at General Research Corp., agreed with Spencer that some current packages are advanced enough to permit end users to generate knowledge systems.

Software can provide guidance for human experts who lack computer expertise to create knowledge systems, Rappaport said. "For most well-structured fields [of knowledge], that's not a problem," she said.

The panelists also agreed that personal computers will play useful roles in both developing and delivering knowledge systems.

"In the near future, personal computers probably will be used largely in experiments," predicted session chairman David Bredwin, a consultant with Arthur D. Little, Inc. "Ultimately, most of the activity will be in AI computing as part of larger systems."

Asked about limitations on microcomputers, Rappaport pointed out that "the primary limitations are size and speed — the size of the knowledge base and the speed with which you need an answer.

"A borderline case would be an expert system that held more than 500 rules," she suggested. However, she noted that 500-rule systems can be networked together to create a large system.

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DCA introduces Smart Alec for IBM micro-mini emulation

ALPHARETTA, Ga. — Digital Communications Associates, Inc. (DCA) has announced a micro-to-minicomputer communications product that reportedly allows IBM Personal Computers, Personal Computer XTs and ATs to communicate with IBM System/34, 36 and 38 minicomputers.

Dubbed Smart Alec, the product allows Personal Computers to emulate an IBM 5251 Model 11 or 5292 Model 1 terminal. When used with a modem, the product can provide remote attachment to an IBM 5294 workstation controller or an IBM 5251 Model 12. Smart Alec comes bundled with file transfer software that allows users to transfer files between the personal computers and the IBM System/34, 36 and 38, the vendor said.

Smart Alec includes a printed-circuit board that reportedly can be installed into any full-length slot, a splice box that can manage the twinaxial cable connecting the personal computer and IBM minicomputers and bidirectional file transfer software for the Personal Computer and IBM minis.

The product reportedly allows users to run three simultaneous host sessions. Users can perform a file transfer, print session and host session at the same time. They can also send print jobs directly to the PC printer, by allowing the PC printer to emulate an IBM 5256 printer, the vendor said.

Smart Alec, including the file transfer software, costs $995. An enhanced version of the File Transfer software, which includes record and field selection capabilities, costs $1,295.

The product will be shipped next month.

DCA is located at 1000 Alderman Drive, Alpharetta, Ga. 30201.

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Tecmar unwraps modem

SOLON, Ohio — A 2,400 bit/sec. internal modem for the IBM Personal Computer has been introduced by Tecmar, Inc. The Phonegate 2400 modem, which fits into one of the Personal Computer's full-length slots, is priced at $789 and comes with two software packages.

The first package is Software Synergy, Inc.'s Respond data communications package, which offers file transfer and emulation of the Digital Equipment Corp. VT52 and VT100 terminals, as well as the IBM 3101 and Hewlett-Packard Co. 2621V terminals and standard TTY devices.

Also included is Tecmar Telephone Management Software, which reportedly causes a list of recently called numbers or a personal telephone directory to be displayed when the telephone's receiver is lifted from its cradle.

Phonegate is also said to offer Touch-Tone decoding, under which its software keeps track of all incoming and outgoing telephone calls placed from the user's telephone or the computer's directory.

Phonegate reportedly can communicate at 2,400, 1,200, 600, 300 and 110 bit/sec., according to Tecmar. It can display messages on the status of outgoing calls and permits the user to switch a person-to-person call to computer-to-computer status.

Tecmar is located at 6225 Cochran Road, Solon, Ohio 44139.

3Com boosts net server line with 70M-byte high-end unit

MOUNTAIN VIEW, Calif. — 3Com Corp. has introduced the 3Server 70, a high-end addition to its family of local-area network servers. It reportedly features a 70M-byte hard disk drive with a storage capacity expandable to 420M bytes.

Priced at $8,995 and available immediately, the system supplements 3Com's 3Server, which was introduced in January and which comes with a 36M-byte disk drive.

While both products reportedly can support up to 50 network users in productivity applications and up to 16 users in transaction processing applications, the 3Server 70 was designed for customers with higher storage requirements, according to 3Com. The 3Server 70's disk drive provides average access time of 28 msec, 3Com said.

3Com also introduced the 70M-byte Expansion Disk, an external disk drive that reportedly works with either server and costs $4,995. Up to five Expansion Disks can be added to the 3Server 70 for the 420M-byte total.

3Com can be reached through P.O. Box 7390, 1365 Shorebird Way, Mountain View, Calif. 94039.

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Analytica drops Reflex software copy protection

FREMONT, Calif. — Analytica Corp. has dropped the copy protection on its Reflex data base software for the IBM Personal Computer. It will also begin selling site licenses of Reflex through its dealers.

Removal of the copy protection will permit the software to be copied more easily and installed in hard-disk systems, Analytica said.

Registered Reflex users reportedly will receive the unprotected version of the software free in the mail. Unprotected versions of Reflex will be available in stores this month. The package remains priced at $495.

The Reflex site licenses will be sold in quantities of 100, 500 and 1,000 units, priced respectively at $30,000, $120,000 and $200,000. Users will be provided with several master diskettes from which they can copy the program up to the specified number of copies permitted in their license, the vendor said.

Documentation reportedly will also be included with each site license at a rate of 10 Reflex manuals for every 100 copies of Reflex permitted under the site license.

Analytica is located at 3155 Kearney St., Fremont, Calif. 94538.

SYSTEMS

■ **Megadata Corp. has introduced its Model Seven, a portable supermicrocomputer based on the Motorola, Inc. 68000 microprocessor and running the AT&T Unix operating system.**

The latest addition to the multiuser 8300 series, the Model Seven reportedly includes 1M byte of memory, a 26M-byte hard-disk storage unit, a 1M-byte diskette drive and two RS-232 parallel ports. Weighing 18 lb, the Model Seven is field upgradable to a total of eight serial ports.

The expansion board costs $650 with 512K bytes of additional memory and $990 with another 1M byte of memory. The Model Seven costs $4,399.

Megadata, 35 Orville Drive, Bohemia, N.Y. 11716.

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PRINTERS/ PLOTTERS

■ Televideo Systems, Inc. has introduced a low-end terminal for use with personal computers.

The Model 905 is a 14-in. terminal designed for office automation applications. It is reportedly compatible with the Televideo family of products and with the Applied Digital Data Systems Viewpoint A2 terminal.

It costs $1,495 and will be available in September.

Televideo Systems, P.O. Box 6602, 550 E. Brokaw Road, San Jose, Calif. 95150.

BOARD-LEVEL DEVICES

■ Direct, Inc. has introduced the PC102 interface, which provides IBM Personal Computers with Digital Equipment Corp. VT100, VT52 or VT102 terminal emulation capabilities.

The PC102 combines a display enhancement adapter card and software and reportedly provides the Personal Computer with the same video display capabilities as the DEC terminals.

The interface is said to provide the Personal Computer with 80- by 132-col. screen presentation, all DEC VT102 character sets and attributes.

The product costs $595, the vendor said.

Direct, 4201 Burton Drive, Santa Clara, Calif. 95054.

■ Kamerman Labs has announced the Excelerator add-on board that reportedly increases processing speed of the IBM Personal Computer and Personal Computer XT four times.

The product was designed around a 10-MHz Intel Corp. 8086 chip and includes up to 640K bytes of high-speed random-access memory (RAM).

Excelerator users can reportedly return to the machine's original speed with a manual hardware switch or through software commands.

The board includes an optional battery-powered clock and calendar, serial port and parallel printer port.

The board is priced at $1,095 for 128K bytes of RAM, $1,340 for 256K bytes and $180 for each additional 128K bytes. The other options are available for $295.

Kamerman Labs, 8054 S.W. Nimbus Ave., Beaverton, Ore. 97005.

■ STB Systems, Inc. has announced Chauffeur, a video board for the IBM Personal Computer, Personal Computer XT and AT.

The product is said to convert any IBM-compatible color graphics display into a full screen format compatible with the IBM monochrome monitor.

In graphics mode, the board reportedly supports IBM standard resolutions of 640 by 200 pixels with two monochrome shades and 320 by 200 pixels with four monochrome shades. The board includes drivers supporting high-resolution displays for Lotus Development Corp.'s 1-2-3 and Symphony and Ashton-Tate's Framework software.

In text mode, Chauffeur produces 80- by 25-line displays, according to the vendor. The product is said to provide 16K bytes of display memory in text mode.

Chauffeur is priced at $395.

STB Systems, Suite 125, 601 N. Glenville, Richardson, Texas 75081.

■ Viasyn Corp. has introduced a color graphics board for its Compupro 286 multiuser personal computers.

The PC Video board reportedly takes full advantage of the computer's Intel Corp. 80286 microprocessor and is said to be compatible with such software as Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase II. Up to eight of the boards can be daisy-chained to support a group of graphics users.

It costs $495.

Viasyn, 3506 Breakwater Court, Hayward, Calif. 94545.

SMALL from page 37

tended to undermine shared resources as the driving force for buying personal computer nets. In one example, the typical price of a 10M-byte hard disk drive has slid 83% since 1982, while cost of a 3Com Corp. network card has dropped only 35%, he pointed out.

Bill Osborne, IBM's product manager for broadband network products, agreed with Melin that information sharing now provides a stronger rationale for acquiring a microcomputer network. He predicted, however, that "we'll see another class of expensive resources coming in," particularly high-end net servers. These new systems will help to support the trend toward larger nets, Osborne added. "[Personal Computer] nets grow as quickly as rabbits do, once you get them installed," he said.

■ Explaining why shipment of 3Com's Ethermac local-area network software has been delayed from June to September, product manager Derek Brown highlighted some of the frustrations in moving the Macintosh into a multiuser environment. "Spooling to the Laserwriter from the Mac is damn near impossible," he said.

■ General Research Corp.'s The Intelligent Machine Model (Timm) expert system shell is a spin-off from work on battlefield surveillance for the U.S. Army, and development of Timm/PC arose rather casually as the company prepared for an artificial intelligence conference, according to Wanda Rappaport, director of software sales and marketing.

"We found no way to use a terminal to our [Digital Equipment Corp.] VAX computer, so we put it on a personal computer," she said. "Most of the market research was done at the conference." There was talk of calling the new microcomputer version Tiny Timm, Rappaport said, but cooler heads prevailed in the end.

■ Among a host of optical memory devices on display, the most interesting was a prototype erasable 3¼-in. drive from Verbatim Corp. The company expects to begin volume production in fourth-quarter 1987, offering 40M-byte and 100M-byte models. Senior Vice-President Geof Bates said OEM costs will be approximately $300 for the drive and $30 to $35 for the removable disks.

■ Kari Sterne, senior vice-president for marketing at Viasyn Corp., had a quick explanation of why that company changed its name from Compupro Systems, Inc., last year: "There are 136 companies which start with 'Compu,' and we were always being confused with two or three of them in Chapter 11 [of the Federal Bankruptcy Act]."

PC2 from page 37

with limited expansion capabilities.

Separately, IBM announced a limited recall program for the Personal Computer AT's hard disk drive adapter card. "A random, intermittent type of problem" has cropped up.

Affected customers soon will receive a notification letter from IBM that includes a test diskette. If the system fails the test, customers should notify the vendor that sold them the machine, for free, on-site repair.

Serial numbers for the machines that may be affected are 5019001 through 5141250 for the base AT model and 0064001 through 0146900 for the enhanced version.

GRAPHICS from page 37

an ink-jet printer with a resolution of 4,000 dot/line and a price of $15,000. Such resolution, he said, might previously have cost as much as $200,000. While even $15,000 is too much to pay for a stand-alone machine, he said, it is a reasonable cost for a printer that is to be used in a personal computer network.

As for the role of the mainframe in this new world of high-quality personal computer graphics, Pailer said he does not expect large-scale processors to be completely supplanted. For one thing, the mainframe, not the personal computer, is the best machine on which to base a corporationwide, networked graphics application. In addition, the mainframe is attached to top-quality output devices that are too expensive for stand-alone use.

In that latter case, Pailer predicted that the mainframe will become a "network peripheral." Under such a system, micro users could upload spreadsheet files to a mainframe-based graphics package, interact with the mainframe graphics software to produce a chart, then output the chart on high-resolution plotters and printers serving the mainframe.

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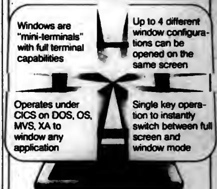
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THE COMPUTERS WITH THE FUTURE BUILT IN

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DATAPHONE II is a family of digital and analog modems, multiplexers, and diagnostic control devices for multilevel network management and control. To the family we just added the DATAPHONE II Model 2600 Digital Data Service Unit, an integrated DSU and Channel Service Unit in one compact, easy-to-install and operate unit. Plus, it is fully compatible with the DATAPHONE II equipment you're using now.

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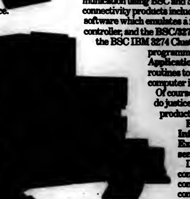

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COMMUNICATIONS

SNA architects outline probable enhancements

By John Dix
CW Staff

A panel of IBM representatives outlined the future needs of the company's Systems Network Architecture (SNA) earlier this month at a National Computer Conference session called "IBM's SNA — Meeting the Challenge of Change," and discussed an existing product that can be used in network planning.

The session was chaired by Edward H. Sussenguth, who headed up IBM's SNA development team from the time of its inception in 1974 until last year, when he became an IBM Fellow. SNA is now used in more than 20,000 IBM 370-architecture host computers, Sussenguth said.

No one expected SNA to be accepted so quickly, nor did the architects anticipate that networks would get as large. A large corporate network may have 12,000 to 15,000 terminals, 10 IBM 30 series host processors, 30 4300-type CPUs, 100 IBM Series/1 minicomputers and 30 to 100 front-end processors. A network supporting banking or point-of-sale terminals may have 60,000 terminals, Sussenguth said.

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> *No one expected SNA to be accepted so quickly, nor did the architects anticipate that networks would get so large.*

To accommodate the advent of such large networks, IBM was forced to increase network addressing from 16 bits to 23 bits, a modification that is representative of changes made to SNA to keep up with industry and network advances, he added.

Some of these changes were outlined by Robert J. Sundstrom, manager of communications systems architecture with IBM's Communications Products Division.

According to Sundstrom, the first SNA product was the 3600 banking system, supported with a CPU running Vtam with a channel-attached 3705 front-end processor running the Network Control Program.

Today Vtam networks serve as backbones, and Sundstrom said he can foresee the day when network addressing will have to be extended from 23 bits to 48 bits.

Other changes the manager anticipates include a reduction in required maintenance, reduced network definition procedures, the ability to support peer-to-peer communication among low-end processors, local network support and increased availability.

Reducing scheduled maintenance will enable 24-hour network availability, Sundstrom said. Similarly, the need to increase availability during working hours is encouraging development of alternate routing to bypass failed net components. Availability also forces the issue of dynamically changing networks.

Sundstrom noted that SNA will be upgraded to reduce the definition or system generation procedures required when systems are added or deleted from a network.

To support small systems outside the domain of the Network Control Program, IBM developed a node type called Physical Unit 2.1. This was complemented with the creation of Advanced Program-to-Program Communications or Logical Unit Type LU6.2. IBM will extend this support to many of its small systems, Sundstrom said.

As these small systems are supported on local networks, there is a growing need to modify SNA to support local network clusters, the architect said. Key to local network support is the ability to integrate network management with that of the backbone network.

Ideally, SNA will someday be able to use

See SNA page 60

WIRE TAP
Daniel Minoli

Planning cuts net setup costs

Effective planning and coordination between data communications network designers and implementation groups can reduce the overall cost of installing or modifying a network and increase end-user satisfaction and uptime.

Several tips based on experience are highlighted below to sensitize potential users and managers to some of the issues involved. These suggestions apply whether the implementation is carried out by a separate implementation group or is handled by a multipurpose corporate communications group.

It is important to avoid the situation known as "customer not ready," where a service supplier comes to install a circuit but is denied access or cannot pinpoint the location. These situations can also be encountered by a vendor trying to install data terminals or communications equipment upon finding that power, cabinet space or other prearrangements have not been made.

Surprisingly, customers often are not prepared to receive products and services. International record carriers, for example, average two to five such situations per installation attempt. This writer has seen a customer turn a vendor away seven times. Since rescheduling visits normally requires at least one week, this translates into delay.

See DELAY page 60

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities, Inc. in New York.

Indesys' one-way message service melds micros, radio

CHICAGO — Indesys, Inc. unveiled an electronic message delivery service here at the recent National Computer Conference that combines satellite distribution and FM radio delivery technology.

Indesys is backed by printer maker Epson America, Inc.; ABC Video Enterprises, Inc., a division of American Broadcasting Companies, Inc.; a venture capital firm called The Hillman Co.; and the Indesys Management Group.

The company will provide one-way message distribution services to personal computers equipped with an integral, proprietary Indesys receiver card or to specially equipped printers. An antenna will also have to be installed at each receiving site.

In practice, users create messages on a computer and, after finding the published address of the intended recipient, enter one or more addresses to which it is to be sent. The message is then transmitted at 300, 1,200 or 2,400 bit/sec. through a local ABC station, which routes the call to a computer at Indesys' headquarters in Mountainview, Calif.

Indesys' computer converts the public identification code into a private address code and forwards the message via a 38.4K bit/sec. microwave link to a satellite earth station. The earth station bounces messages off of a satellite down to affiliated radio stations.

These stations, in turn, broadcast the message on a subcarrier frequency along with their normal commercial radio broadcast. While largely unused today, FM subcarrier radio waves — which are not detected by common FM radios — are used to broadcast services such as Muzak of Philadelphia's subscription background music.

Indesys customers are assigned a unique address, and their receiving equipment collects only those messages addressed to it. Because FM subcarrier transmissions, like standard FM radio, blanket all receiving equipment in a given radius, only the receiver addressed can decode its messages.

For additional security, Indesys can change the private addresses of receiver equipment frequently. A receiver may have as many as 64 subaddresses to support multiple users. The computer stores incoming messages keyed to separate passwords for each subaddress.

The Indesys' receiving card for personal computers contains a decoder and a buffer. If the computer is turned off, the receiver can store and buffer up to 100 pages of text. The Indesys board is compatible with Epson's QX-16 micro or IBM's Personal Computer. Locations that do not have personal computers can use properly outfitted Epson smart printers.

Offering several services

Several service tiers will be offered, including Maxmail, guaranteed one-hour delivery at 20 cent/page; Digitext, same-day delivery (typically within four hours) at 15 cent/page; and Nitetext, guaranteed overnight delivery by 8 a.m. for 10 cent/page. There are no monthly minimum charges.

Indesys will initially transmit data to locations in New York, Los Angeles, Chicago, Dallas and San Francisco through these respective FM radio stations: WPLJ, KLOS, WLS, KTKS and KOME.

The company said it expects to support several other major markets beginning in 1986.

Indesys is located at 2425 Garcia Ave., Mountain View, Calif. 94043.

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CONTROL DATA

SNA

from page 57

all types of communications facilities — including local networks, leased and dial-up lines and X.25 networks — regardless of node type.

Gauging effect on net operations

To help gauge how these new SNA capabilities will affect network operations, IBM offers the System Network Analysis Program/Simulated Host Overview Technique (Snap/Shot).

Snap/Shot is a discrete simulation modeling tool, according to Bud Gross. Gross is a manager of design and analysis tools with IBM's Telecommunications Products Organization.

Snap/Shot was developed in conjunction with SNA and was initially intended to show performance differences between SNA and IBM's Binary Synchronous Communication and start/stop protocols.

Used for benchmarks

Today, Snap/Shot is used in place of benchmarks to gauge how changes made to a network will affect net performance.

Benchmarks are time consuming and cost roughly $250,000, almost 20 times what it costs to model with Snap/Shot, Gross stated.

Snap/Shot is completed in a week and offers results that are said to be nearly as accurate as actual benchmarks.

Studying net changes

Snap/Shot can be used to study net changes on I/O, host processors or terminal populations and is recommended for use in capacity planning, in the consideration of data base management systems and configuration analysis.

It is not recommended for the analysis of batch-only applications or for determining factors such as the size of Vtam buffers, Gross said.

Model output is created in terminology and forms that users are accustomed to, the design and analysis manager noted.

John Link, a senior planner for communications programming with IBM's communications products division, concluded the session by saying that the overall intent is to increase the availability of SNA networks by reducing planned and unplanned outages.

The largest vulnerability of SNA nets — and thus the greatest need for enhancement — is in software, Link said.

DELAY

from page 57

Many customer-not-ready situations, particularly those related to access and awareness of the customer contact, can be avoided easily. The customer should know the service contact point locally, but more important at the remote site, where customer-not-ready situations are more common.

Second, the contact individuals should be clearly informed about the upcoming installation, the vendor, the desired location and the preliminary tasks to be performed.

Third, the approximate date of installation should be communicated to the contact individuals.

Customer-not-ready situations and ensuing delays can occur at all stages of a project.

In some cases, physical installation of the local loops and end-to-end testing are done in two phases, such as with installation of international circuits that require space segment allocation. A customer delay for such services may require having to back out of the satellite, again resulting in major delays.

Most vendors cancel an order after finding the customer is not ready a number of times, typically four, after which users must reenter the order.

Limiting problems

One way to limit this situation is to give vendors enough time to deliver the desired product.

A reasonable interval between the ordering date and the due date should be factored into the plan.

While users may occasionally be forced to push a vendor for early delivery of one or two units, if a large number of units is required, 45 to 60 days is reasonable.

High-speed digital services may, on the other hand, require three to 12 months to deploy; if the service is needed sooner bypass alternatives should be explored.

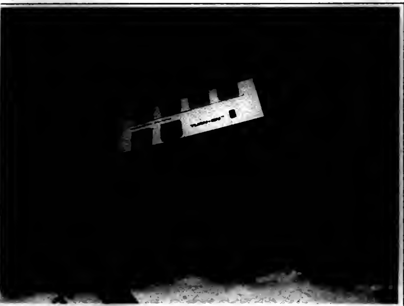
Allow enough time for unit and integration testing. Don't discount Murphy's Law.

One may buy a component that, according to specifications, should integrate into an overall system. But time and again the user finds himself chasing an unexpected bug. Even the most minute task can translate into a problem.

Pursue validation testing with the vendor before bringing the equipment in-house.

The system may have worked well at another installation, but how it will work in your application, which may have a different load, is another consideration.

The above are only a few examples of issues that must be properly addressed at planning and implementation time to achieve smooth and cost-effective network deployment and service initiation.



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As a central processor, the System/36 can help pull a company together—it can connect PCs to mainframes. And the communications capabilities of the System/36 allow people throughout an organization to share information and resources to handle almost any job, anytime, from IBM Personal Computers or System/36 terminals.

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This new IBM computer marries the System/36 and the IBM Personal Computer to give you the best of both worlds. With a price starting at $5,995, the System/36 PC is an affordable standalone system for a small business. And it can be used in a larger company where multiple unit installations offer the best solution.

The System/36 PC is made up of a 5364 processor attached to an IBM PC, PC XT or PC AT. And you can connect up to three more of these personal computers. Or you can connect terminals such as System/36 printers or displays.

The System/36 PC comes with a 1.2 MB diskette drive and either 40 or 80 MB disk storage, depending on your information storage needs.

The System/36 model 5362.

The middle-sized System/36 processor, the 5362 can support up to 22 local IBM Personal Computer terminals and up to 64 remote terminals. With 1 MB of main memory and 120 MB of disk storage, the 5362 is powerful for its size—about as big as a two-drawer filing cabinet. And, you can add memory and additional features with plug-in modules for easy growth.

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INFOTRON SYSTEMS

SYSTEMS & PERIPHERALS

INSIDE
Terminals/78

Honeywell true to CPUs

Exec reaffirms staying power in mainframe area

By Peter Bartolik
CW Staff

Despite its reliance on NEC Corp. for a high-end mainframe, Honeywell, Inc. has not reduced its commitment to mainframe technology, according to the top executive of the Information Systems division.

William Ray, who earlier this year was appointed executive vice-president of Information Systems, spoke with *Computerworld* during the recent National Computer Conference and directly addressed the company's staying power in the mainframe area.

The company's next generation of mainframes is currently in the research and development stage and will be made by Honeywell, Ray said.

Ray was appointed to his current position during a reorganization that saw Honeywell Vice-Chairman James Renier relinquish his position as president of Information Systems and move up to share the chief executive office with Chairman Edson Spencer. Like Renier, Ray moved over to Information Systems after heading the industrial controls groups.

That reorganization, Ray conceded, "did send a signal that some people interpreted to mean that Honeywell will emphasize controls over computers." But that is the wrong impression, he asserted.

Honeywell for too long operated its computer and controls divisions as separate companies. Integrating those businesses provides added strength, particularly in high-growth areas such as factory automation and networking, Ray said.

See CPU page 70

COM print system out

CHICAGO — Bell & Howell Co.'s Computer Output Microfilm (COM) Division introduced a COM print and duplicating system at this month's National Computer Conference here for medium- and low-volume DP centers.

The COM Print 6000 system for in-house fiche printing is said to cost about $80,000, according to the company.

The system, which receives input from IBM or IBM plug-compatible mainframe computers, looks like a printer to the host computer.

Job setup is performed on the host using Bell & Howell setup software for subsequent storage in the system library.

Effective image reduction of 48:1

The system has a 128-char. set; 105mm unsprocketed roll, emulsion-in, dry-silver film type; and a magazine capacity of 200 ft of master and 100 ft of duplicates. The effective image reduction is 48:1, according to Bell & Howell.

Ten copies of a 2,000 page report can reportedly be produced on the COM Print 6000 in less than an hour on eight fiche weighing less than two ounces per copy.

According to the vendor, the total cost for printing and duplicating that report would be $4.88.

More information can be obtained from Bell & Howell at the COM Division, 16691 Hale Ave., Irvine, Calif. 92714.

Elite supermicro unveiled

WICHITA, Kan. — Elite Computer Systems has announced the Expert 32, a supermicro based on multiple National Semiconductor Corp. 32032 microprocessors.

Users can attach up to six CPUs in a tightly coupled configuration. The system was designed to run the company's ECS PVS operating system.

A basic Expert 32 system, including a CPU, 2M bytes of main memory, 32K bytes of cache memory, a 60M-byte hard disk drive, a peripheral interface card, four RS-232 serial interfaces, a disk controller, a Centronics Data Computer Corp. parallel interface and 12 expansion slots, costs $18,900.

Elite Computer Systems is located at 4129 May St., Wichita, Kan. 67209.

The tangled web of micros, minis, mainframes

SHOP TALK
William Inmon

Ask DP managers if they know the difference between a mainframe and a microcomputer and the response will probably be: "Of course I know the difference. What a silly question!" Ask a salesman if an IBM 3081 is a mainframe or if an IBM XT/370 is a micro, and you will probably get the same response.

Indeed, the DP community has a strong intuitive notion of the boundaries that define a mainframe, mini or microcomputer. But upon even a superficial analysis, it is clear that the real differences between the types of processors are blurred. In fact, commonly used methods for differentiating between the various processor groups, such as the millions of instructions per second (Mips) measure, add to the confusion.

Classifying processors is important to many people. For example, market researchers must have a way to break down the marketplace for analysis. There are different forces which drive the mainframe, minicomputer and microcomputer marketplaces. Fundamental to understanding those forces is the ability to define solidly how the marketplace is segmented.

DP managers are also affected by the differences between processors because they have to make daily decisions on whether their companies are heading in the right direction.

For a long time, Mips was the primary

See DEFINE page 66

William Inmon is a director at Coopers & Lybrand in Denver and a noted author on the subject of data base design.

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DEFINE

from page 65

criterion by which the market could be divided. A mainframe was a processor with an instruction rate higher than N Mips, and a minicomputer was a processor that ran slower than N Mips. And for a while, this distinction had a certain amount of validity. It has rapidly become obsolete.

One reason for this obsolescence is that mainframe Mips are not necessarily equivalent to minicomputer Mips. For example, a mainframe is usually capable of accomplishing a task in a given number (N) of instructions, while a minicomputer takes more instructions (N+M).

A second factor that makes it difficult to compare minicomputer and mainframe Mips is that in certain environments, such as on-line situations, the capacities of the two machine types become saturated at different levels.

Another problem with Mips is that the criterion is often a moving target. In the early 1960s, a mainframe processor typically fell into the .04- to 1-Mips range. In the late 1960s and early 1970s, the mainframe range was between 7 Mips and 12 Mips. Now, mainframes generally fall in the 8- to 25-Mips range.

When the mini came on the scene in the mid-1970s, it created new types of processing and new markets. Digital Equipment Corp.'s first processor operated in the .05- to 1.5-Mips range.

By the early 1980s, minicomputer manufacturers introduced more pow-

See DEFINE page 70

The million instructions per second (Mips) rating of some different machines vs. their announcement dates

Source: [illegible] — *Economics of Technology and the Computer Industry*, [illegible], 1985

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Computerworld Espana is the only MIS/DP newspaper in Spain. Each week 8,300 MIS/DP executives turn to *Computerworld Espana* for information on new products and services, current applications and industry trends.

Commodore World, is a monthly publication with a circulation of 22,000. Editorial targets the Commodore user with reports on all aspects of Commodore operations.

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SYSTEMS & PERIPHERALS

DEFINE

from page 65

erful processors, in the 0.7- to 1.5-Mips range. In the late 1970s and early 1980s, the microprocessor appeared on the scene. The first microprocessors were small machines operating at about .01 Mips. Today, more powerful ones have appeared.

The problem with using this moving Mips scale is that there are many overlapping areas.

Based on historical information, it is a safe bet that by the 1990s, a mainframe may be a processor operating at greater than 30 Mips; a mini will operate at between 5 Mips and 30 Mips; and a microprocessor will operate at less than 5 Mips.

It is also a good bet that if Mips is used as a dividing line, the distinction between processor classes will become even more blurred.

Another problem is IBM's coupled processors. IBM has developed dyadic processors, and the possibility exists that it could also bring out triadic or quadratic processors. Is a quadratic processor made up of four 10-Mips uniprocessors in a 40-Mips machine? Or is it four 10-Mips machines?

Consequently, any confidence the average DP professional can place in using Mips to distinguish between mainframes, minis and micros is not justified.

But the intuitive basis for system classification probably comes from more than just size. It also stems from historical market activity.

In the 1960s, IBM introduced the general-purpose 360 series, with a single instruction set usable on multiple models. As the demand for more processing power grew, IBM increased the size of its mainframe processors.

In doing so, IBM left a niche in the market that was filled capably by DEC, Data General Corp. and others. The real growth of the mini manufacturers did not come until the mid-1970s.

The minicomputer has grown in power since then and is projected to grow even more.

The intuitive basis for processor classification appears to be a combination of Mips, historical market activities, price and a series of other constantly changing factors. Consequently, the same criteria for classification are seldom defined the same way by any two sources.

Thus, the real differences between processors is in their use and the functions they perform. Admittedly, the differences in use are not as great between a mainframe and a mini as between a mini and a microprocessor. But there are significant differences nonetheless.

CPU

from page 65

According to Ray, Honeywell's "primary objective is to support its customer base." The company sees its role as implementing greater integration of equipment through distributed processing networks.

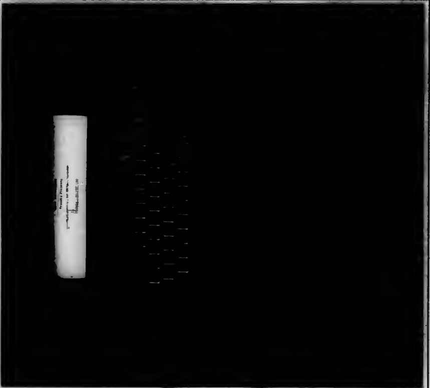
TERMINALS

■ **Lear Siegler, Inc. has unveiled the ADM 3E, a 14-in. CRT terminal.**

The unit is available with a green or amber screen and seven programmable keys that are shiftable for 14 nonvolatile functions. Other features include dynamically allocated function-key memory, basic editing capabilities and an optional bidirectional printer port.

The ADM 3E costs $399.

Lear Siegler, 901 E. Ball Road, Anaheim, Calif. 92805.



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COMPUTER INDUSTRY

Top spot at Wang eluded Cunningham

By Clinton Wilder
CW Staff

ROCHESTER, N.Y. — Wang Laboratories, Inc. and Computer Consoles, Inc. (CCI): a tale of two computer companies. A $2.5 billion office automation giant and a $130 million specialized minicomputer upstart, with nothing in common except rapidly declining profits — and John F. Cunningham.

Last week, the 42-year-old Cunningham put CCI on the industry map by becoming its chairman and chief executive officer, departing the presidency at Wang after a 17-year climb to almost the top rung of its corporate ladder. Make that "almost" with a capital A, because he clearly wanted to be the boss. That desire led Cunningham, who has been courted for presidential openings at Apple Computer, Inc., Prime Computer, Inc. and Apollo Computer, Inc., to choose a relatively obscure niche company with, in his words, "outstanding technology."

"The current industry slump presented an unusual opportunity," Cunningham said on his second day on the job at CCI here. "In the jobs that went to John Sculley at Apple, Joe Henson at Prime and Tom Vanderslice at Apollo, I essentially saw no real opportunity for real capital appreciation in the five- to 10-year time frame. The stock and equity [were] overvalued."

> *'I didn't want 35% or 40% shareholders looking over my shoulder. I wanted to run the show myself. It should be fun.'*
>
> — John Cunningham
> Computer Consoles, Inc.

Cunningham considered other small companies but found exactly what he wanted at CCI. "Not many small foundation companies have the technology behind them to be long-term survivors," he said. "[CCI] also presented an unusual opportunity because the current chairman, [Herman A. Affel Jr.], is 65, and there were no other major individual holdings in the company. I didn't want 35% or 40% shareholders looking over my shoulder. I wanted to run the show myself. It should be fun."

Ironically, Cunningham joins the company as it faces a smaller scale version of a major Wang problem: bloated expenses. CCI recently reported a second-quarter pretax loss of $12.4 million or 40 cents per share, on $35 million revenue, down from a $2.8 million profit on sales of $36 million a year ago. CCI spends twice as much — about 20% of its revenue — as the industry average on research and development, according to Omri Serlin, president of Itom International, a research and consulting firm in Los Altos, Calif.

Cunningham, who presided over the release of 1,600 Wang employees earlier this

See RESIGN page 76

- Digital Research cut its work force by 25% and wooed Northern Telecom and Motorola as investors/**72**
- Lexisoft, charging illegal bundling of its software, sued Eagle Computer for $100 million/**72**
- Uccel acquired Corodale, Inc. for $10 million/**73**

Backlog-driven micro price slashing predicted

By Kathleen Burton
CW West Coast Bureau

An estimated inventory backlog of more than one million personal computers will cause prices to plummet by the year's end, according to microcomputer industry analysts.

Vendors and major retail chains denied an inventory problem, but the analysts predicted price slashing during the pre-Christmas sales season.

"Because of the excess inventory, plummeting prices will be widespread, and the consequences could be disastrous," said Ken Lim, an analyst with Dataquest, Inc., a market research firm in San Jose, Calif. Manufacturers and retail dealers will attempt to dispose of inventory through gray market discounters, initiating a price war later in the year, he predicted.

Lim said the industrywide inventory buildup is due to the deflated personal computer market, which is predicted to grow 22% this year, compared with 80% last year and 300% in 1983.

Brian. Jeffery, vice-president of research at International Technology Group in Palo Alto, Calif., asserted that the industry's total personal computer inventory runs into the millions of units.

Backlog running IBM micro strategy

Jeffery said that IBM's inventory of various models is currently over the half-million unit mark. "The inventory backlog is running IBM's personal computer strategy," Jeffery claimed, "and it could delay the introduction of IBM's PC2 computer." IBM recently denied the existence of a PC2 product.

IBM uses subcontractors for many of its manufacturing and assembly operations, said Michael Murphy, publisher of the "California Technology Stock Letter" in San Francisco. "This makes it difficult for IBM to turn down the manufacturing spigot, compared with other vendors like [Apple Computer, Inc. that] have total manufacturing control," Murphy said.

Besides IBM's backlog, Lim said there are also half a million personal computers stockpiled by Personal Computer-compatible manufacturers. According to Lim, the companies most affected include Corona Data Systems, Inc. in Westlake Hills, Calif.; Eagle Computer Corp. in Garden Grove, Calif.; ITT Corp. in New York; Wang Laboratories, Inc. in Lowell, Mass.; and Televideo Systems, Inc. in Sunnyvale, Calif.

The only major IBM Personal Computer-compatible vendor not affected by excess inventory, Lim said, is Houston-based Compaq Computer Corp. Compaq has not had sufficient production capability to

See BACKLOG page 73

Slump prompts belt tightening

With mid-year financial results demonstrating a continued sales slump, several companies have implemented a variety of cost-cutting measures in recent weeks.

Companies that have implemented actions ranging from layoffs to plant shutdowns represent a broad spectrum of the computer industry. In recent weeks the following measures have been announced:

- Burroughs Corp. said some 300 middle-management and secretarial positions will be eliminated under a reorganization that places overall responsibility for development and implementation of all product business plans under a new Corporate Program Management Group.

The group, headed by company Vice-President Fred R. Meier, formerly of the Systems Products division, will absorb the company's various prod-

See SLUMP page 72

A few winners weather storm

Two software companies, a supercomputer vendor and a maker of engineering workstations were among those weathering the second-quarter storm of bleak computer industry news with recently announced profit and revenue gains.

- Cray Research, Inc. of Minneapolis last week reported that second-quarter revenue almost doubled over the year-earlier period, and profits tripled.

Supercomputer manufacturer Cray said revenue for the quarter ended June 30 was $77.2 million, up from $42 million a year earlier. Profits were $13.6 million, or 90 cents per share, up from $4 million, or 27 cents per share.

Cray Research Chairman John A. Rollwagen said the company installed 13 new systems in the first half of the year and expects to install an additional 17 systems in the second half.

See WINNERS page 76

Chip makers post operating losses

Intel Corp. and Advanced Micro Devices, Inc. (AMD) both recently reported operating losses for the quarter just ended as sales slumped from the previous quarter.

Separately, Seeq Technology, Inc. announced the departure of two top officers and a third-quarter loss of $3.8 million.

Intel, of Santa Clara, Calif., reported a second-quarter operating loss of $8 million, although it was able to report net profits of $9 million, or 8 cents a share, by reversing a first-quarter tax accrual of $5 million.

That figure was down from year-earlier profits of $55 million, or 47 cents per share. Revenue for the quarter just ended was $360 million, down from $410 million a year earlier, the company reported.

For the first six months of 1985, Intel reported

See CHIP page 73

Cash-short Digital Research cuts staff, seeks investors

By Kathleen Burton
CW West Coast Bureau

MONTEREY, Calif. — Digital Research, Inc. recently announced that it will lay off 25% of its work force and is seeking equity investment from two customers.

Chief Executive Officer John Rowley said the company is taking steps to increase its cash reserves, which have been depleted by the high costs of new product development.

Under an agreement presently being negotiated, Rowley said, OEM customers Northern Telecom, Inc., based in Ontario, Canada, and Motorola, Inc., based in Schaumburg, Ill., would acquire minority equity positions in Digital Research. The companies will launch several joint development projects over the next several months if the agreements are approved by Digital Research investors, Rowley said.

A spokesman for Northern Telecom said an alliance with Digital Research would benefit the company because it would enable Digital Research's Concurrent PC-DOS operating system and Graphics Environment Manager (GEM) software to be used with its multiprocessor Meridian DV-1 data/voice system. Motorola would not comment on a possible alliance with Digital Research.

Several top Digital Research executives have recently resigned from the financially beleaguered firm. Rowley took over the CEO title from company chairman and founder, Gary Kildall, who left the company on June 28 but remains chairman of the board. In other moves, Steve Maysonave, vice-president of marketing and world trade, and Bruce Cohen, vice-president of U.S. sales, also left the company at the end of June.

The layoffs will affect 75 sales, marketing, engineering and support workers at the company's headquarters here, said John Meyer, Digital Research's director of marketing.

Meyer blamed the layoffs on weakening orders from OEMs, which represent 80% of the company's sales. However, Meyer said, revenue from the sale of the GEM program and the Concurrent DOS and Concurrent CPM 86 operating systems will increase later in the year.

Over the past year, cutbacks have reduced the total number of Digital Research employees from over 500 last year to less than 300. But, analysts said, that even with these cutbacks, the company will need additional help from strategic partnerships to stay in business and will post annual revenue at least 30% below last year's $55 million.

"[Digital Research's] cash flow problems are severe," said Paul Cubbage, an analyst at Dataquest, Inc., a market research firm in San Jose, Calif.

However, Cubbage added, "Rowley is making all the right moves to keep the company afloat." Rowley is trimming expenses, negotiating with potential partners and focusing the company's product line on graphics applications and systems software, its strongest suits, Cubbage said.

Digital Research's troubles began three years ago when the company tried to enter too many diverse markets, said Richard Matlack, a vice-president at Infocorp, a market research firm in Cupertino, Calif. In 1983 and 1984 the company tried to market several new product lines. According to the analyst, "[Digital Research] just lost focus."

Lexisoft files bundling suit against Eagle

DAVIS, Calif. — Lexisoft, Inc. earlier this month filed a $100 million lawsuit alleging copyright infringement of its Spellbinder word processing program by Eagle Computer, Inc.

The Lexisoft suit charges that Eagle, a hardware manufacturer based in Garden Grove, Calif., continued to distribute Spellbinder with its computers after its contract to do so expired in February 1984. Since then, Eagle has continued to bundle the software without paying Lexisoft any licensing fees.

Filed in U.S. District Court in San Jose, Calif., the suit also named the Bank of America National Trust and Savings Association in San Francisco. Lexisoft claimed that the bank, an Eagle creditor, began administering funds for the financially troubled company last fall but did not ensure that its debts to Lexisoft were paid.

The Lexisoft suit also names Gerald L. Kappenman, Eagle president, and Ronald N. Mickwee and Charles Kappenman, past presidents of Eagle, for civil conspiracy and violation of California's Unfair Practices Act. This law forbids a firm from giving away another company's products.

A spokesman for Eagle denied the claims. He said the company has had an ongoing OEM arrangement with Lexisoft to distribute and bundle the Spellbinder program since 1981. According to the spokesman, Eagle has complied with the financial arrangements and has paid Lexisoft over $250,000 in royalty payments.

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SLUMP from page 71

uct management functions, which are currently dispersed throughout Burroughs, according to Chairman and Chief Executive Officer W. Michael Blumenthal.

The company had earlier announced it had experienced a slight decline in profits from the year-earlier period.

■ Control Data Corp. said it will shut down six minicomputer assembly and test plants for 11 days later this year. The closings, scheduled for the end of August, end of November and end of December, will impact 4,000 employees of the company's computer systems group who are involved in manufacture of superminicomputer products.

"Because we do not see any immediate resurgence or strength coming from the computer industry, we are taking precautionary steps to ensure that our operations are in line with our markets," said L. E. Jodsaas, president of the computer systems group.

CDC, which later announced a $24.9 million operation loss for the group, said that the decision will balance inventories with projected sales.

■ Hewlett-Packard Co. said it will shut all U.S. manufacturing and administrative facilities for one or two days each month at least through October and that it has cut pay by 5% for 14,000 domestic sales and service employees and by 10% for 27 top management personnel. Additional production halts are possible during the Thanksgiving and Christmas holiday periods, according to the company.

"We hope we can return to a full schedule before the end of the year, but we are also prepared to continue expense-reduction measures beyond 1985," said Dean O. Morton, executive vice-president and chief operating officer.

■ Winchester disk drive manufacturer Computer Memories, Inc. of Chatsworth, Calif., said it dismissed 300 workers, or 29% of its domestic manufacturing work force. The company said the layoffs were a result of increased offshore manufacturing capacity; it employs 900 workers in Singapore.

■ Disk drive manufacturer Atasi Corp. layed off 62% of its work force, or 164 employees out of a total of 264. The company said that it is seeking a new lender because a $6 million line of credit was canceled earlier this year.

■ Semiconductor equipment manufacturer Varian Associates, Inc. instituted a six-month freeze on pay raises and terminated 300 contract workers and 60 permanent employees; the company had previously announced its intent to cut 1,700 jobs from its 15,500 work force and said it will reach that goal with an additional round of layoffs in September. The company also said it will shut down production for 10 days later this year and has eliminated incentive bonuses for top executives.

■ Microcomputer manufacturer Intertec Data Systems Corp. of Columbia, S.C., announced it has ceased all manufacturing and marketing activities and laid off about 40 of its 52 employees.

The company said it will concentrate its remaining resources on development of products and that it will continue to provide factory warranty repair service and that additional service will be provided through its dealer network.

Uccel acquires Corodale assets

DALLAS — Uccel Corp. announced recently that it has acquired for $10 million cash the assets of Corodale, Inc., a Boston-based vendor of IBM DOS/VSE systems software.

According to a Uccel spokesman, Corodale has some 1,800 U.S. installations of its products, designed for tape and disk management and job scheduling. The spokesman said the move strengthens Uccel's position in the DOS/VSE marketplace.

Corodale, which the spokesman said has experienced annual revenue growth of about 36% in recent years, will operate as part of Uccel's Systems Software Division.

SUPERSHORTS

Rolm Corp. announced the formation of Rolm Europe Ltd., a wholly owned subsidiary, and plans to establish a development and manufacturing facility in the UK.

The telecommunications products developed by Rolm Europe will meet European specifications, and Rolm will procure a substantial number of components and subassemblies from firms throughout Europe. Final assembly and testing will be done in the UK.

Frank Oniana has been appointed president and managing director of Rolm Europe. Oniana was the former managing director of Philips Electrical Industries in the UK.

■

Execucom Systems Corp. announced that it has joined Microelectronics and Computer Technology Corp. as an associate member of that group. Execucom is the first software company to join the research organization.

■

Members of the Central Office Machine Dealers Association and the Texas-Oklahoma-Louisiana-Arkansas Office Machine Dealers Association have approved a proposal to merge the two respective organizations.

Both groups are regional affiliates of the National Office Machine Dealers Association, the national organization of independent business equipment and systems retailers.

BACKLOG

from page 71

build excess machines, Lim said.

The manufacturers themselves, however, deny there is an inventory problem. "Our inventory is manageable," an IBM spokeswoman said. Representatives from Digital Equipment Corp. in Maynard, Mass., Hewlett-Packard Co. in Cupertino, Calif., Televideo and Apple made similar claims.

"Earlier in the year, we had a glut of Apple II computers, but we closed production plants, laid off workers and brought our production in line with demand," an Apple spokeswoman said. A DEC spokesman said the firm has no backlog of its traditionally slow-moving Rainbow computer.

Retail chains and independent dealers contacted by *Computerworld* also denied there is excess inventory.

CHIP

from page 71

revenue of $735 million, down from $782 million in the first half of last year.

According to Gordon E. Moore, chairman and chief executive officer of Intel, "OEM customers have reduced their semiconductor component consumption rates, which is stretching our original estimates of the time required [for those customers] to work off excess inventories."

AMD announced an operating loss of $14.4 million for the first quarter of fiscal year 1986. However, the company was able to post a net profit of $739,000, or 1 cent per share, due to $15.5 million in tax credits. Those results compared with year-earlier profits of $38.2 million, or 66 cents per share. In the fourth quarter of 1985, the company posted profits of $25.7 million, or 44 cents per share.

Sales for the semiconductor manufacturer tumbled to $150.5 million, compared with $234.2 million a year earlier and $201 million in the fourth quarter of fiscal year 1985.

"AMD is finally feeling the full impact of the recession that has afflicted our entire industry since last fall," said W. J. Sanders III, AMD's president and chairman. He added that the company does not expect any increase in demand during the current quarter and said AMD has preserved jobs while controlling expenses.

At San Jose, Calif.-based Seeq, a manufacturer of nonvolatile semiconductor memory devices, the company's president and chief executive officer, M. R. MacPherson, and chief financial officer, Donald T. Aanestad, resigned. The company announced the formation of an office of the president composed of acting CEO E. Floyd Kvamme, a Seeq board member and general partner with the venture capital firm of Kleiner, Perkins, Caulfield and Byers; Gerald A. Robinson, vice-president of operations; and J. Daniel McCranie, vice-president of sales and marketing. Named chief financial officer was Patrick B. Brennan, former vice-president and treasurer with National Semiconductor Corp.

Seeq announced that third-quarter revenue slumped to $8.1 million from $13.8 million a year earlier and from $9.1 million in the second quarter of the current fiscal year.

The loss of $3.8 million, or 33 cents per share, compared with year-earlier profits of $509,000, or 4 cents per share, and a second-quarter loss of $4 million, or 30 cents per share.

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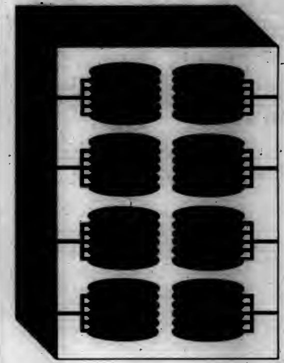

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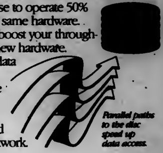

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TANDEMCOMPUTERS

RESIGN

from page 71

year, may administer similar medicine to CCI. "One of my first goals is to get expenses in line with the current size of the business," he said. "There has to be belt-tightening across the board, and they haven't faced up to it yet. It will affect the employee side, because that accounts for 60% to 70% of expenses."

CCI is known as a technology company, Cunningham as a marketing man. "I think it's a perfect balance for my skill sets," Cunningham said.

Cunningham said he will try to focus CCI's direct sales force on turnkey office systems for such vertical markets as the legal and financial profession, while hoping to parlay his corporate contacts into big-ticket deals with large OEMs and value-added resellers. Other items on the Cunningham agenda include a potential move into the private branch exchange market to continue sales to the divested Bell operating companies, whose past purchases of CCI's Directory Assistance Systems fueled the company's growth in the 1970s. Cunningham will also be looking for other corporate partners — but for bigger fish than Boulder, Colo.-based NBI, Inc., whose announced merger with CCI collapsed earlier this year [CW, Feb. 18].

"I've spent a reasonable amount of time looking at foundation companies and concluded that not a lot would help us," he said. "But alliance with larger organizations is very possible."

As the largest individual shareholder of CCI with 400,000 shares, Cunningham clearly has a vested interest in returning the company to profitability. The firm has already projected a substantial loss for 1985, and opinions vary as to when things will turn around.

"Cunningham is absolutely the best news CCI and its stockholders have had in at least three years," Itom's Serlin said, "but he can't do it by himself. Their problem is a lack of focus; they have four major product thrusts, all of them based on a different version of [AT&T's Unix], all of them really unrelated. There's no marketing structure that connects these things together."

While Cunningham replaces a 65-year-old chairman at CCI, another 65-year-old chairman, An Wang, has resumed the president's chair at the company he founded. Cunningham downplayed the rumored personality clashes among top Wang management prior to his resignation, stressing that the company had outgrown him.

"It was a difficult and emotional decision, and Dr. Wang was very supportive; he knew it was what I wanted," Cunningham said. "I think I enjoyed the 1973-81 period the most. One of the frustrations in a larger organization is losing contact [with employees] . . . 30,000 is a tough number. There was less drama [to my departure] than people are writing into it. It was really a personal decision on my part."

Several observers of Wang feel many Cunningham loyalists will soon follow him out the door, perhaps not by their own choice, at the middle-management level. "Several changes have to be made at Wang, and this is just the first of them," said Vincent Flanders, associate editor of *Online Data Access*, an Austin, Texas-based independent magazine for Wang users.

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WINNERS

from page 71

■ Apollo Computer, Inc. of Chelmsford, Mass., also reported an almost twofold increase in revenue. Apollo said revenue for the second quarter ended June 29 was $87.5 million, up from $46 million a year earlier. Profits were $7.3 million, or 21 cents per share, up 43% from year-earlier profits of $5.1 million, or 17 cents per share. In the first quarter of the current fiscal year, Apollo reported revenue of $118 million and profits of $44 million.

Apollo President and Chief Executive Officer Thomas A. Vanderslice expressed caution about prospects for the remainder of the year due to concern about the flow of orders from OEM and system builder customers. "Our ability to maintain present levels of profitability in the second half of 1985 will depend on the overall state of capital spending," Vanderslice said.

■ Lotus Development Corp.'s second-quarter profits jumped 40% from the same period one year ago. The Cambridge, Mass.-based micro software leader earned $10.7 million, or 65 cents per share, compared with $7.6 million, or 48 cents per share, one year ago. Revenue soared 82% to $59.3 million from $32.6 million in the year-earlier quarter.

Lotus Vice-President of Finance and Administration Mead Wyman attributed the increase to continued strong demand for the firm's IBM Personal Computer-based products, 1-2-3 and Symphony. The first shipments of Jazz for the Apple Computer, Inc. Macintosh were also strong, but Wyman said it is too early to judge the product's market success.

■ Management Science America, Inc. (MSA) announced that net income from continuing operations more than quadrupled from $717,000, or 4 cents per share, a year ago to $3 million, or 17 cents per share, in the second quarter of this year. Atlanta-based MSA had posted an actual loss of $1.6 million in the second quarter of 1984, reflecting the $2.4 million divestiture of its Peachtree Software division to Intelligent Systems Corp.

MSA's revenue in the recent quarter climbed 34% to $38.1 million, up from $28.5 million a year ago. A spokesman said the introduction of MSA's fourth-generation language-based Information Expert helped spur a 44% gain in revenue from support agreement fees during the quarter.

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Bank of America's Investment Systems supports our Investment Securities Division and Capital Markets Group which are involved in investment banking activities around the world. As the technical entity behind these global money market organizations, Investment Systems is engaged in a series of sophisticated development projects that are vital to our competitive advantage in the securities processing and trading arena.

Currently, Investment Systems supports over 30 applications and is comprised of a variety of processing environments including mainframes, microcomputers and minicomputers. Our exciting and fast-paced atmosphere requires technically proficient professionals with excellent interpersonal and motivational skills. Candidates should have experience in one or more of the following environments and languages: MVS/OS, VM/CMS, OS/JCL, COBOL, NOMAD 2, and FORTRAN. A knowledge of investment banking products would be a definite asset.

Team Leaders

You will lead 2–8 professionals in developing our Global Strategic Automation Project which includes an on-line Trading and Decision Support System. In addition to providing technical guidance, you will oversee system enhancements and maintenance activities and act as a primary client liaison in determining user needs. You should have 3+ years of lead experience on complex development projects with an extensive background in structured systems analysis, design and programming. A strong knowledge of relational data base theory and the normalization process is required. A familiarity with realtime/on-line processing and telecommunications applications preferred.

Technical Support Staff

You'll participate in the development, enhancement and maintenance of systems supporting our Capital Markets Group. Candidates should have at least 2 years experience in structured analysis, design and programming; a familiarity with text video switching systems would be a plus. We also have a specific need for a PC expert who'll respond to PC-related client requests, including funding acquisition and software development/customization. Applicants responding to our PC position should have 2 years of PC application development experience with a technical knowledge of IBM-PC hardware and communications configurations and peripherals, as well as software packages.

Successful candidates will initially join us at our San Francisco facility and will later move with us to our new custom designed technology center in suburban Concord, less than 30 miles east of San Francisco. In addition to a state-of-the-art environment that features faster development capabilities and the latest productivity tools, you'll be provided with an attractive salary, relocation and benefits package.

Interested candidates should send a detailed resume, indicating salary history and position of interest to: Bank of America, Investment Systems, Staffing Specialist, 3228-CW729, 150 Spear Street, San Francisco CA 94105. Only direct applicant inquiries will be considered at this time. An equal opportunity employer.

Share Our Strategy, Strengthen Our Team.

Bank of America

We believe in Lasting Relationships

With a proven record of successful placements in the disciplines of data processing, accounting, finance and banking, that spans nearly two decades, ROMAC® has earned a reputation for producing effective and enduring results.

We go beyond just matching resumes with job openings. We take the time to know our clients. This is the important first step towards helping you realize your personnel needs.

Our consultants have first-hand experience working in the fields they represent. Working on a one-to-one relationship, your ROMAC® consultant can analyze and evaluate each candidate's special strengths and skills. When we make a recommendation you can be certain the individual meets your specifications.

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716/854-6203
Charlotte, NC
704/555-[illegible]
Chicago, IL
312/265-[illegible]
Cleveland, OH
216/771-4822
Columbus, OH
614/221-7077
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Denver, CO
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(213) 836-8366 (Collect)

SENIOR ANALYST

Popular Western NY food processing firm has immediate need for sr. analyst in their DOS/VSE processing center. Req. solid bkgrd. in DL1. Pref. CICS & COBOL. Best fit is someone who enjoys rural lifestyle & low cost of living. To $31,000.

ROBERT HALF
OF BUFFALO, INC.
420 Main Street
1310 Liberty Building
Buffalo, NY 14202
(716) 842-0801
Personnel Agency

SENIOR PROGRAMMER/ ANALYST

DIS, a leader in business systems and communication networks, is seeking qualified individuals for employment in its Product Development Department.

Qualifications include: 3 or more related years experience, ability to work with users. Computer Science/Business degree highly desirable.

DIS offers a comprehensive benefits and compensation package. Please send resume to: Personnel, Product Development, DIS Corp., [illegible] West [illegible], [illegible] WA [illegible]. EOE.

DIS CORP.

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DATA RESOURCES, USA
Division of Landrum Personnel Resources
P.O. Box 1373C
Pensacola, Florida 32596-1373
CALL TOLL FREE (800) [illegible]
IN FLORIDA (904) 434-2321 COLLECT

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EXPERIENCED IPARS/ACP PEOPLE

To meet Qantas' marketing objectives over the next five years, increased emphasis is being placed on developing new and improved facilities for our IPARS-based Reservations and Departure Control System. Applications are invited for suitably qualified people to join an enthusiastic and highly skilled group working in a very challenging and interesting development environment in Sydney, Australia.

Analysts and Programmers

At least 2 years' experience with ACP/IPARS and IBM Assembler is essential. Experience with RES or DCS applications is desirable.

Message Switching Programmers

At least 2 years' experience with IPARS MESW software is essential. TPF or ACF experience is desirable.

Systems Programmers

At least 2 years' experience as an ACP Systems Programmer is essential. TPF or ACF experience is desirable.

ACP Data Comms Programmers

At least 2 years' experience as a programmer with ACP Communications software, preferably SLC, is essential. TPF, ACF or SNA experience would be advantageous.

While permanent appointments are preferred, temporary contracts up to 2 years will be considered.

A generous relocation package will be offered, together with assistance with immigration formalities.

These are outstanding opportunities for those attracted to the lifestyle "down under" Please write without delay to:

VICE PRESIDENT PERSONNEL
QANTAS AIRWAYS
360 POST STREET
SAN FRANCISCO CA 94108 USA

DATA BASE DESIGN ANALYST

Appraise logical data base design for consistency with physical data base implementation and conformance to data dictionary standards. Requires a BS/BA Degree in Computer Science with 6 years data processing experience, including four years as a Data Base Analyst or Data Dictionary Specialist. Also have DOS/VSE and/or other IBM operating systems experience and specialized knowledge in Data Dictionary, DL/1 Data Base, and CICS. Experience in a relational DBMS is definitely a plus.

Competitive salary and a generous benefit package are provided as well as a challenge of continuing to meet the changing needs of a complex and developing industry. U.S. Citizenship is required. Send resume and salary history to:

Mr. R.D. Bailey,
Human Resources Manager
Nuclear Fuel Services, Inc.
Erwin, Tennessee 37650

An Equal Opportunity Employer M/F/H

Local 3-677 of the OCAW is on strike
at the NFS Erwin Facility

NFS

PRIME COBOL

Computer Horizons Corp., a national data processing company, seek several experienced Prime COBOL data processing professionals. These opportunities exist in our Miami office.

As a key member of the CHC staff, you'll earn an above average salary and an outstanding benefits package.

For further consideration, send us your resume or call:

Judy Schwartz
305-662-2610

COMPUTER
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CORP.

Koger Executive Center
8125 N.W. 53rd Street
Miami, Florida 33166

An Equal Opportunity Employer M/F

SOFTWARE SPECIALISTS

Cutler-Williams is a major diversified data processing company serving Fortune 500 clientele nationwide with offices in Detroit, Cleveland, Chicago, and Dallas. We currently have positions available for Applications Programmers and Programmer/Analysts with a minimum of 2 years experience in one or more of the following areas:

- IMS DC/DC, COBOL and/or PL/1
- CICS/DL1
- CICS/VSAM, COBOL
- OS COBOL and/or PL/1

We provide state-of-the-art opportunities and continued career growth. We offer top level salaries and overtime pay as well as fully paid medical and dental insurance, tuition reimbursement and profit sharing plans.

Call or send resume to:

[illegible]
Corporate Recruiter
CUTLER-WILLIAMS INCORPORATED
[illegible] Villa Creek Drive, Ste. [illegible]
Dallas, TX 75234
[illegible]

Subcontractors will be considered
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PROGRAMMER/ANALYSTS SYSTEM 38 RPG III

Lead Programmer/Analyst and Systems Development Supervisor positions open. New company emphasis on systems development. Minimum 2 years System 38 RPG III experience required. Prefer prior lead or management experience. Marine construction applications for progressive, well-established shipyard. Enjoy the challenge of major Systems Development in relaxed scenic, family oriented Door County. Competitive salary and benefits. Send resume to:

Personnel Manager
Peterson Builders, Inc.
101 Pennsylvania Street
Sturgeon Bay, Wisconsin 54235
EOE M/F/V/H

UNIVERSITY OF NEBRASKA
Systems Programming Manager

Plan, schedule and supervise activities of the Operating Systems Group. Assist in evaluating, recommending and installing new hardware and software. Work closely with vendors and faculty personnel. Develop comprehensive goals and [illegible] relative to structure, staffing, organization and group standards and practices.

Requires Bachelor's in Computer Science or related field plus six years related experience in operating system software design and problem determination or a combination of education and experience totaling 10 years. Should have experience with VM and MVS operating systems and related subsystems such as VTAM, CICS, IMS, JES2. Supervisory experience is highly desirable. Submit letter of application and resume by August [illegible] to: [illegible], 225 Nebraska Hall, University of Nebraska-Lincoln, Lincoln, Nebraska 68588-0581.

Affirmative Action/
Equal Opportunity Employer

PASADENA CITY COLLEGE
DP STAFF AUGMENTATION - PHASE II

The Board of Trustees has approved a reorganization plan to consolidate and effectively apply appropriate modern computing resources to maintain the leadership role of the college. Phase II seeks forward-looking professionals who will fill key positions in the continuing implementation of this plan.

USER CONSULTANT FOR ADMINISTRATIVE SERVICES

Requires experience in business administration, instruction or educational offices as well as experience in business, payroll, personnel or financial systems; [illegible] years in software development with staff supervision or user consulting. Initial salary will be commensurate with experience and education, in the range [illegible].

PROGRAMMER/ANALYST FOR ADMINISTRATIVE SERVICES

Requires experience in programming and program design and analysis, with extensive HP3000 COBOL and IMAGE database experience. Initial salary will be commensurate with experience and education, in the range [illegible].

District-paid health and welfare benefit package covering employee and eligible dependents over $4,000 annually.

A DISTRICT-SUPPLIED APPLICATION FORM is required and must be received in Personnel by August 16, 1985. To obtain a district application contact:

Personnel Services
Pasadena City College
1570 E. Colorado Blvd.
Pasadena, CA 91106
(818) 578-7[illegible]
EOE/AA

WE'VE GOT YOU COVERED

with opportunities to match your ambitions

Fireman's Fund, a major financial services organization, has terms broad enough to meet your professional goals. We're one of Northern California's largest IBM shops and we're embarking on numerous new application development projects for our state-of-the-art, multiple IBM 3081 MVS/XA shop which includes DB2, IMS, CICS, TSO and VTAM.

This growth, in the high visibility setting of our Marin County Office, combines with room for achievement and an easy commute to round out our base of opportunity. The result is a company wide enough — and flexible enough — to keep the professional ambitions of goal-oriented, self-motivated individuals covered.

We have the following openings:

Lead Systems Analyst

We are seeking a Lead Systems Analyst who will provide technical design consulting to multiple project teams to develop an integrated systems architecture using mainframes, minicomputers and intelligent workstations. Candidate should have 8+ years of progressive application development experience preferably in insurance or financial services systems. (Respond to LG1-LM)

Sr./Lead Data Analyst

We are seeking a Sr./Lead Data Analyst to support major development projects. Must be familiar with entity/relationship data modeling and logical data design. Experience in supporting application development by working with conceptual data model through logical data design preferred. (Respond to LG1-AP)

Sr./Lead Data Base Analysts

We are seeking Sr./Lead Data base Analysts to support a variety of new applications development projects. Must have 3+ years experience in application and physical data base design. (Respond to LG1-TT)

Sr./Lead Systems Programmers

We are seeking Sr. and Lead Systems Programmers with problem determination/resolution performance analysis/tuning, and software installation experience. Lead positions require planning and leadership skills. TSO, JES2, DFHSM, SMP/E and Security knowledge are desirable. (Respond to LG1-SA)

We offer an excellent salary and benefits package. For immediate consideration, please send resume with salary history to: Fireman's Fund Insurance Companies, Property & Liability, Systems Division, Personnel Dept. LG1, 1600 Los Gamos Road, San Rafael, CA 94911. An equal opportunity employer.

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- **PROGRAMMER ANALYSTS** - to design and program New Systems utilizing COBOL or PL1 in IBM/MVS environment. IMS or IDMS is a plus.
- **PROGRAMMER ANALYSTS** - Major development effort involving Honeywell GCOS mainframe. Selected candidates will be experienced in Honeywell GCOS, COBOL and IDS II or TP.
- **IMS DBA'S** - Total responsibility for the DBA function including Sysgens, Logical and Physical Design, Backup, Recovery, Tuning and Security.
- **REAL-TIME MICRO'S** - Degreed professional with 1+ years experience DESIGNING & PROGRAMMING REAL-TIME ASSEMBLER software at module level. Experience with Automotive or Engine Control Systems is a plus.

Send resume including salary requirements and location preference to:

Mr. R. Johnson
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Relocation assistance will be provided.

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COMPUTERPEOPLE is a rapidly growing software services and consulting firm with offices in major U.S. cities. We have an immediate need for experienced mini/micro specialists to support client applications in telecommunications technology, telephony, and process control.

We require a B.S. degree in Computer Science, Math or Electrical Engineering and three to five years of practical experience. An M.S.E.E. or M.S.C.S. degree is desirable. Applicable skills include:

- VAX C and UNIX
- Intel Assembly language
- Telephony hardware/software design
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We are looking for talented new employees, but will consider qualified subcontractors. Columbus and southern east coast cities. For additional information, call or send resume to:

COMPUTERPEOPLE
DATA SERVICES DIVISION

2850 Corporate Exchange Dr.
Suite 100
Columbus, Ohio 43229
(614) 895-7300

INSURANCE OPPORTUNITIES

A national financial services corp. is developing a marketing operation for a [illegible] million dollar insurance agency headquartered in Dallas, Texas, offering personal lines and life insurance products. Candidates are being considered for the following positions:

MIS DIRECTOR

Duties include establishing and managing a new DP environment. Must have 5 years experience in the VM, VS, IBM environment. Must also have insurance and supervisory experience with strong exposure and/or training in accounting.

PERSONAL LINES UNDERWRITING MANAGER

Duties include managing the underwriting staff and working with insurance companies to coordinate underwriting criteria and claims problems. Must have 10 years insurance experience on a nationwide basis and expertise in agency public relations, management and product development, and strong exposure and/or training in automation.

INSURANCE MARKETING MANAGER

Duties include all marketing activities including telemarketing and direct mail techniques. Must have 10 years national insurance marketing experience with knowledge of telemarketing, direct mail and exposure, and/or training in automation.

These positions offer an excellent salary and benefits package. Please send resume with salary history to:

[illegible]
P.O. Box 7794
Van Nuys, California 91409

SYSTEMS ADMINISTRATOR - To write systems utility programs, assist in hardware and software installation, troubleshooting, research, purchases and repairs; assist users to become familiar with operating systems. Must be familiar with video lottery programming. Salary - $26,000 per year. Must have 6 months experience in job offered or 1 year experience as programmer. B.S. degree in Business or Computer Science required. Apply with resume and proof of experience to Georgia Department of Labor, 1275 Clarendon Avenue, Avondale Estates, Georgia 30002. Control #GA6664021.

NEW START IN Systems [illegible]

Billion $ corporation seeks several fast-track programmers for this ground-floor opportunity.

Must have 2+ yrs on any of the following MVS, NCP-VTAM or CICS. Will train in XA.

If you're serious about a career move call collect Robert Montgomery at (919) 872-3848. Over 6 yrs exp specializing with systems programmers.

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Raleigh, NC 27629

FOX-MORRIS

IMS/DB SPECIALIST

Howmet Turbine Components Corporation has an immediate opening on its Data Base Administration staff for a person with experience in the administration and support of IMS Databases. This position offers a challenging opportunity for a qualified individual to get in on the ground floor of the development of database standards and procedures in a dynamic data processing environment.

This person will report to the Data Base Administrator and have primary responsibility for establishing IMS databases, developing database backup, recovery, logging procedures, and monitoring database usage and performance. The ideal candidate will have a BS/BA degree and 3-5 years DP experience with a minimum of 2 years maintaining IMS/DB database definitions and recovery procedures in a CICS environment.

Howmet is a leading manufacturer of investment castings for turbine engines. Located in scenic western Michigan near the shores of Lake Michigan, our state-of-the-art data processing environment includes: IBM 3083, MVS, TSO, CICS, IMS/DB, and Datacom/DB. We offer an attractive salary as well as liberal employee benefits. Please send detailed resume and salary history in confidence to:

Walter B. [illegible]

UNIVERSITY OF PETROLEUM & MINERALS
DHAHRAN, SAUDI ARABIA

RESEARCH INSTITUTE

The Research Institute has immediate openings in the following area:
DATA BASE SPECIALIST

M.S. Degree with an Energy Economics background and 5 years experience in a research environment.

Minimum regular contract for two years, renewable. Competitive salaries and allowances. Free air transportation to and from Dhahran each year. All earned income without Saudi taxes. Two and half months duty each year with 45 days vacation with salary plus other fringe benefits as per policy.

Apply with complete resume on academic, professional and personal data, list of references and with copies of certificates, diplomas and degrees. Include home address and telephone number for contact to:

UNIVERSITY OF PETROLEUM & MINERALS
HOUSTON OFFICE, DEPT. 229
5718 WESTHEIMER, SUITE 1550
HOUSTON, TEXAS 77057 USA

Screening to take place first week of October.

SENIOR AUDITOR-EDP

We have an immediate opening for an experienced Senior Auditor-EDP. The successful candidate must possess a Bachelor's degree and at least 3-5 years' prior experience in EDP auditing, preferably in a manufacturing environment.

Will be responsible for review and audit of all computer usage within company, including distributed sites, dedicated sites and personal computer usage to ensure proper procedures are followed. Will also assist with financial and operational audits. Experience with IBM mainframes and data base systems will be helpful. Some travel may be involved.

If you have the qualifications we seek, we can offer you a competitive compensation and benefits package. For immediate confidential consideration, please forward your resume to.

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- **ADABAS (Natural)**
- **IDMS/ADSO**
- **ASSEMBLER**
- **UNIX/"C"**
- **DEC/VAX**
- **COBOL**
- **PL/1**
- **CICS**
- **TANDEM (Tal or Pathway-COBOL)**

For information on opportunities in ANY of our geographical areas and the excellent compensation and benefits plan we offer, including PAID OVERTIME, PROFIT SHARING, RELOCATION ASSISTANCE, RETIREMENT, PAID VACATION and more, call or rush your resume to: Personnel Recruiter, COM-PRO, (813) 875-7866, 5420 Bay Center Drive, Suite 100, Tampa, FL 33609. eoe m/f

COM-PRO

NEW ENGLAND

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Established mfr. seeks astute pro to lead new H/S planning & implementation. Smaller DP environ., req. prev. mfg. sys. develop. Prefer DEC VAX or PDP-11 + micros exp. $36,000.

BOSTON
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HP3000 - Well estab. BOSTON fin'l. svcs. firm seeks user-oriented P/A for growing dept. Environ. is HP3000 QUIZ PC's. Oppty. to develop fin'l./acctg. apps. w/hi vis. to financial execs. $26,000.

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Learn S/38 & RPGIII through 1986 conv. Immediate assignment is to supv. 1 operator & do all production support for fin'l. apps. in SYS-36 RPGII, OCL, SEU, SDA, DFU environ. Expanding dept. needs sharp upward mobile pro for RTE. 128 sub. facility. $27,000.

HARTFORD
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Design/develop the latest fin'l. sys. & work w/software vendors in installing the latest on-line apps. Highly visible corp. environ. using CICS, IMS & PC's in a TP link. Challenging growth position. Salary to $33,000.

HARTFORD
SYS. PROGRAMMER

NE oppty. for IBM/MVS indiv. w/ exposure to CICS and/or VTAM. Client offers full reloc. + car! Salary to $60,000+.

PROVIDENCE
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Consumer goods mfr. seeks Sr. Sys. Analyst to handle proj. mgmt. respons. Supv. prog. & analysis on major mfg. apps. devel. Proven sys. analysis skills & leadership pot. key requirements. $33,000.

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R-H

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We are looking for experienced and motivated professionals with qualifications that match the positions listed below.

DIRECTOR OF TELECOMMUNICATIONS TECHNOLOGY AND APPLICATIONS PLANNING

5-10 years experience and a successful track record in managing a sophisticated telecommunications network and complex systems environment. A Bachelor's degree with strong statistical and analytical background is required.

MANAGER, INTER-PLAN USER SYSTEMS

5 or more years experience in management of information system developments, from specification through implementation. IBM system and database system experience. A B.S. degree in Computer Science is required. MBA or Master's degree in Information Systems desirable.

MANAGER, APPLICATION SYSTEMS

7-10 years experience in designing, developing, and implementing application systems in an IBM environment. 2-4 years hands-on supervisory experience and a college degree required. Exposure to CICS or DB/DC would be desirable.

SENIOR TELECOMMUNICATIONS SYSTEMS ANALYSTS

5 or more years in the design and development of large telecommunications systems. College degree or equivalent work experience is required.

SENIOR CONSULTANT/CONSULTANT, INTER-PLAN USER SYSTEMS

3 to 5+ years experience in systems analysis and development of computer-based information systems, including hardware and software. Experience in business analysis of user requirements. A B.S. degree in Computer Science is required. MBA or Master's degree in information systems for senior position is desirable.

SENIOR ANALYST/ANALYST, APPLICATION SYSTEMS

5 to 7+ years system development experience in an IBM mainframe environment. Knowledge of COBOL, OS JCL, TSO/SPF, and either CICS or DB/DC required. A B.S. degree in Computer Science is desirable.

SPECIALIST, INTER-PLAN ON-GOING OPERATIONS

3 or more years experience in performing data analysis, documentation editing, project or function coordinator and Wang Word Processing system. College degree highly desirable.

ANALYSTS, COMMUNICATIONS BASED APPLICATION SYSTEMS

4 or more years experience working in a TANDEM, TAL non-stop environment. Familiarity with X.25 and communication protocols required. A college degree is highly desirable.

We offer highly competitive salaries and an excellent benefit package that includes fully paid health care, dental and prescription drug coverage, contributory pension plan, 401K, tuition reimbursement, and an in-house corporate fitness center.

Please plan on attending next Wednesday & Thursday. You'll have the chance to discuss our opportunities and your career with our systems management. If you cannot attend, have any questions, or wish to schedule a private appointment, please call Peggi Sturm at (312) 440-6412, Monday-Friday, 8:30am to 4:30pm.

BLUE CROSS
& BLUE SHIELD
ASSOCIATION
676 North St. Clair St., Chicago, IL 60611
An Equal Opportunity Employer M/F

MIS SYSTEMS MANAGER

An Unprecedented MIS Career Opportunity

We need an innovative professional to assist us in the state-of-the-art redesign of our administrative/management information systems. Our Systems Modernization Plan calls for complete replacement of existing software/hardware and data communications without disrupting the current ADP operation.

SALARY:
$44,400-$57,700
Full Government Benefits
U.S. Citizenship Required

MIS NETWORK MANAGER

Job Requirements

- Professional experience at a senior level within the past 5 years preferred in:
  - —analysis, design, development and implementation of local area networks and wide area networks.
  - —application of data communications using asynchronous, SNA and X.25 protocols, integration and testing, data and voice switching and trouble shooting.
- Ability to lead/guide data communications tasks including planning, requirements analysis, and contract development administration/implementation in a multi-project environment.

Social Security Administration, Woodlawn, MD
An Equal Opportunity Employer

To apply, or for more information, call 301/594-3526 before August 7, 1985.

SENIOR SYSTEMS PROGRAMMER DATA COMMUNICATIONS

Our expanding IBM data communications environment requires an experienced senior level data communications systems programmer. If your background includes good ACF/VTAM, ACF/NCP and SNA technical skills, we'd like to talk with you.

We offer a challenging opportunity to improve your technical skills in an expanding IBM 3083 MVS environment. Our current division communications network links 26 manufacturing plants and seven sales offices to our Hazelwood data center utilizing SNA and digital circuits. Plans include the implementation of a backbone network connecting the division's data center to other major installations within the corporation, development and implementation of formal network performance monitoring and capacity planning functions and participation in corporate-wide network administration.

This position requires a four-year B.S. degree and a minimum of three years data communication experience in an MVS environment, with solid knowledge of IBM SNA architecture, protocol, and trouble-shooting techniques. Demonstrated skills with ACF/VTAM, ACF/NCP and 3725 hardware internals are also required, as is experience with MSNF.

As the key data communications specialist with the division, you will install and support all data communications software, troubleshoot network problems and develop necessary support utilities. You will also actively participate in network hardware/software/topology planning, evaluate new technologies, prepare strategic recommendations to management and participate in inter-divisional networking projects.

Boise Cascade Composite Can Division manufactures composite cans and plastic bottles. Our division headquarters is conveniently located in northwest St. Louis County, which offers excellent schools, a comfortable suburban lifestyle and a friendly midwestern atmosphere which is second to none. We offer a comprehensive benefits package including relocation assistance and the opportunity to work with a superior group of EDP professionals.

This position offers the right candidate an outstanding opportunity for technical and professional growth in an exciting, state-of-the-art environment. For consideration, please forward your resume, including salary history, in confidence to:

Gary C. Bellaire
Systems Programming Manager
Boise Cascade
Composite Can Division
13300 Interstate Drive
Hazelwood, MO 63042
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500 DP Openings

[illegible]

Rick Young, CPC (704) 366-1800
Corporate Personnel Consultants, Inc.
3705 Latrobe Drive, Suite 310
Charlotte, NC 28211

CAROLINAS & VIRGINIA LOCATIONS LET'S GET SPECIFIC

My clients have a need for personnel with specific skills. I'm prepared to discuss the following positions in detail with you so you can determine if they are a match for your career goals. One phone call could make you aware of an opportunity you wouldn't want to miss. LET'S TALK

SYSTEMS PROGRAMMER (MVS) —— to $[illegible]
SYSTEMS PROGRAMMER (CICS OR VTAM) —— to $[illegible]
SYSTEMS PROGRAMMER (VM) —— to $[illegible]
PROGRAMMER ANALYSTS (VM/CMS, NOMAD, or SQL) to $[illegible]
SYSTEMS ANALYSTS (VM/CMS, NOMAD, SQL, or Relational Databases) —— to $[illegible]

CALL ASAP
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919-584-5501

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3535 IDS Center
Minneapolis, MN 55402

SYSTEM CONSULTANTS
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These positions can bring Large Rewards, High Satisfaction, Major Challenges & Tremendous Growth.

SKILLS REQUIRED INCLUDE:
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LOGICAL OPTIONS
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Programmers-Tech Support
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2 yr assignments in either McLean, Va., Phoenix, Ar. or Connecticut Area

Honeywell tech support DPS/8. 3 yrs min GCOS 8 GMAP. Communications a plus. For further information, call Maggie Lipak,
212-307-0939
or submit resume to:
Interface Inc.
17 West 54 St., NY, NY 10019.

EDP PROFESSIONALS

GROWMARK, Inc., a large agri-business firm, has immediate openings for qualified professionals seeking careers in a number of areas within Data Processing. We can offer challenging opportunities in the following areas.

MINICOMPUTER SPECIALIST

Responsibilities will include new development projects in addition to support of existing applications which utilize Honeywell DPS/6 equipment and software. An ideal candidate would have prior experience with DPS/6 hardware and software including the MOD-400 operating system. COBOL programming skills are required.

PROGRAMMER/ANALYST

Responsibilities include programming in support of new development projects in addition to maintaining existing applications. An ideal candidate would possess at least two years' experience in a Honeywell environment, have the ability to write COBOL programs and possess knowledge of structured programming.

APPLICATION SPECIALIST

Responsibilities include system design and complex programming assignments in support of new development projects and existing applications. An ideal candidate would possess strong programming skills and/or design experience in addition to Honeywell background. Prior experience in data base and online transaction processing is desirable.

Located in Bloomington, Illinois, an individual can enjoy the advantages of living in a two university community with excellent schools, shopping, recreational and cultural opportunities. In addition to a competitive salary, we offer an attractive benefit package. Interested candidates should send resume and salary requirements to:

GROWMARK, Inc.
Manager, Corporate Personnel
1701 Towanda Avenue
Bloomington, Illinois 61702-2500
AN EQUAL OPPORTUNITY EMPLOYER

GROWMARK

ASSISTANT DIRECTOR

The Computing Services Office at the University of Illinois is seeking an Assistant Director to take responsibility for management of basic campus services. The office has several large CDC and IBM machines as well as a variety of medium scale systems. Together they support about 600 simultaneous users. The Assistant Director will be responsible for systems operations, programming, user services, and other aspects of support. Approximately 30-40 people report through this position.

CSO also has groups responsible for campus data networks, personal computer support, operational support of a national supercomputer facility based on a CRAY X/MP, and several facility management services. Total staff is in excess of 100.

Computing is a major and growing activity at this campus. It supports a research program in excess of $100 million per year and a student population of 35,000. This position requires good management skills, a familiarity with instructional and research use of computers, and the ability to deal imaginatively with a diverse and rapidly changing environment. University experience and/or an advanced degree are desirable. Starting date is as early as possible. Salary will be competitive, based on qualifications. To assure full consideration, resumes should be sent by September 1, 1985 to Joyce McCabe, Computing Services Office, 150 Digital Computer Laboratory, University of Illinois, 1304 W. Springfield, Urbana, Illinois 61801.

The University of Illinois is an Affirmative Action/Equal Opportunity Employer.

SENIOR SYSTEMS ANALYST

Join Coulter Electronics, a respected world leader for over 25 years in the design and manufacture of biomedical instruments. We are currently searching for a Senior Manufacturing Systems Analyst who has heavy systems design and user interface experience in a manufacturing environment.

Position requirements include MRP experience, B.S. degree in Computer Science, or equivalent, plus 5 years systems design experience utilizing Cobol, CICS, RPG 2, Vollie and large IBM mainframes. System 38 and RPG III in desirable. Responsibilities include system design/modification to solve business problems once they are defined, as well as, install new/modified system.

If you are interested in an excellent salary and a comprehensive benefits package, please mail resume to: Marsha Kellstrom, Professional Recruiter, COULTER ELECTRONICS, INC., 690 West 20th Street, Hialeah, Florida 33010. Equal Opportunity Employer.

COULTER ELECTRONICS, INC.
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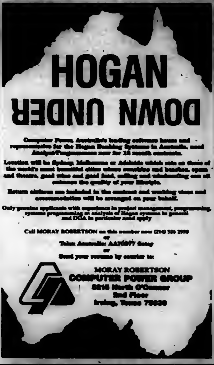

Computer Power, Australia's leading software house and representative for the Hogan Banking Systems in Australia, need Analyst/Programmers now for 12 month contracts.

Location will be Sydney, Melbourne or Adelaide which rate as three of the world's most beautiful cities where sunshine and beaches, opera and theatre, good wine and good food, sailing and windsurfing can all enhance the quality of your lifestyle.

Return airfares are included in the contract and working visas and accommodation will be arranged on your behalf.

Only genuine applicants with experience in project management, programming, systems programming or analysis of Hogan systems in general and DDA in particular need apply

Call MORAY ROBERTSON on this number now (214) 556 2500

or

Telex Australia: AA71977 Sotey

or

Send your resume by courier to:

MORAY ROBERTSON
COMPUTER POWER GROUP
5215 North O'Connor
2nd Floor
Irving, Texas 75039

COMPUTER SPECIALISTS

CH2M HILL, an employee-owned, multi-discipline consulting engineering firm with regional offices throughout North America and overseas, has several staffing opportunities. Positions are all related to the firm's expanding in-house, nationwide computing network utilizing VAX/VMS systems of all sizes.

Minimum requirements for all positions are a BS in Civil or Mechanical Engineering, Computer Science or related field. Two years of experience required.

Positions are:

- ***VAX system Managers***
- ***Computer Aided Engineering Analysts and/or Applications Specialists. Intergraph experience preferred.***
- ***Applications Programmer/Analysts specializing in engineering or business systems.***

*Salary commensurate with experience, flexible benefits. An Equal Opportunity Employer. Qualified applicants (no agencies or telephone inquiries please) send resume, geographic preference and salary history/requirements, in confidence, to: **Manager of Recruiting GEN/CSI, CH2M HILL, P.O. Box 428, Corvallis, OR 97339-0428.***

CH2M

MIS OPPORTUNITIES

Carolina Freight Carriers Corporation is seeking qualified MIS professionals for our expanding Data Services Division. Headquartered in Cherryville, North Carolina, we are the largest subsidiary of Carolina Freight Corporation which is a $400 million dollar per year motor transportation company listed on the New York Stock Exchange.

Due to our continued growth and leadership in the motor transportation industry, we currently have openings in the following areas:

COBOL PROGRAMMERS	- The ideal candidate will have a minimum of 2 years of solid COBOL programming experience.
PROGRAMMER/ANALYSTS	- The qualified individual should have a minimum of 4 years of COBOL programming experience with 50% of the last two years' work experience devoted to analysis.
SYSTEMS ANALYSTS	- The successful applicant should have a minimum of 5 years' experience in systems and programming with the last 2 years devoted to systems analysis.

On-line experience is desired, especially on a Honeywell system running GCOS. We offer an excellent benefits package. For confidential consideration, please send letter or resume, including salary history and willingness to relocate to Cherryville, NC, to:

Mac Beasley
Director of Personnel
Carolina Freight Carriers Corporation
P. O. Box 697
Cherryville, NC 28021

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Apply knowledge of computer graphics, and 2-dimensional and 3-dimensional Geometric Modeling to design and evaluate CAD/CAM (Computer Aided Design/Computer Aided Manufacturing) systems; and apply knowledge of Computer Aided Architecture Design, floor layout, space planning, and architecture design to devise and develop computer drawing systems for architecture use. Require a Master's Degree in Computer Science or Architecture. Education at Master's level should include at least 1 course in Computer Graphics and Geometric Modeling, Computer aided design, and Computer aided architecture design. 40 hrs./wk. 8 a.m. - 5 p.m., [illegible] yr. Send resume and transcript of academic record to:

7310 Woodward Ave.
Rm. 415,
Detroit, Michigan 48202
Reference# [illegible]
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MVS/XEROX
To $35K

Leading international manufacturing firm — corporate just relocated to Twin Cities — seeks systems analyst to lead all applications areas in development of Xerox manufacturing software. Requires 2+ years Xerox experience. Call Mark David or Tim Smith at (612) 339-9001

ROBERT HALF
OF MINNEAPOLIS, INC.
3836 IDS Center
Minneapolis, MN 55402

Systems Analyst

WESTINGHOUSE TURBINE COMPONENTS PLANT, a modern, innovative high technology manufacturing facility, located in Winston-Salem, N.C., is currently seeking a Systems Analyst.

Qualified candidates will be responsible for operating system of IBM 4381, generating and maintaining VM/CMS, DOS/VSE, CICS, SAS, GOOM, DL/1 and other system components, and evaluating and recommending hardware and software for the IBM environment. A BS in Computer Science or Engineering related is required along with a minimum of 2 years systems experience with DOS/VSE and CICS.

This is a challenging and rewarding opportunity with a world leader in the turbine industry. Salary is commensurate with experience and ability, and an excellent benefits package is provided. For consideration, please submit a resume with salary requirements, in confidence to:

John Pavlosky
Human Resources Associate
WESTINGHOUSE TURBINE COMPONENTS PLANT
P.O. Box 969, Winston-Salem, N.C. 27105

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Westinghouse

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Business Information Technology, a rapidly growing consulting firm, needs experienced professionals with knowledge of one or more commercial Human Resources Systems packages like ISI, MSA, M&D, CYBORG, INSCI, PDS, IAI and SI. We specialize in the Integral Systems Inc. (ISI) software. Microcomputers support our projects, and we will be using micro-based applications extensively.

Consulting opportunities are available on the East and West Coasts. Openings require individuals with strong applications knowledge, proven communications skill and

- **Project Management Experience**
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Long range planning dictates the need to open new branch offices in San Francisco, Philadelphia, Boston, Atlanta, Houston, Chicago, Hartford, Los Angeles and New York. If you are a qualified, senior level professional, you may have the opportunity to help open branch offices in one of these target areas.

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BIT serves Industrial, Educational, Financial, Insurance, Government, Medical and High Tech clients across the nation and in Canada. For immediate consideration, please send your resume and salary history to:

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ALASKA ALASKA ALASKA

If a 5,000 mile telecommunications network linking 12 major sites with 8 computer systems sounds challenging the University of Alaska Computer Network would like to hear from you. [illegible]

MINIMUM QUALIFICATIONS

Candidates for both the Programmer and Analyst/Programmer positions must have a demonstrated proficiency with IBM 4381 or equivalent mainframe running OS; OS JCL, IBM system utilities; programming on-line applications and COBOL.

PROGRAMMER (annual salary $32,448 to $37,056):

[illegible]

ANALYST/PROGRAMMER (annual salary $37,316 to $43,482):

[illegible]

Send application material to:

Statewide Office of Human Resource Development
University of Alaska
Room 1, Bunnell Building
Fairbanks, Alaska 99701

UNIVERSITY of ALASKA COMPUTER NETWORK

Closing date: August 16, 1985

Your application for employment with the University of Alaska may be subject to public disclosure if you are selected as a finalist for the position. The University of Alaska is an AA/EEO employer and education institution.

SOFTWARE DEVELOPMENT

Accepting resumes from advanced systems professionals with experience in operating systems, compiler development, artificial intelligence, local area networking, workstations, UNIX, ACA etc. Prefer BS/MS/Ph.D degree in Electrical Engineering and/or Computer Science with a commitment to work with the best. We are a nationwide permanent placement service with clients recognized as the leaders in their fields. All fees and expenses paid by employer. Send resume or call:

N.B.S., INC.
[illegible]
Suite [illegible]
Dublin, OH 43017
(614) [illegible]

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UNIX COBOL/BASIC PROG. CENTRAL ILLINOIS

Central Illinois company is diversifying and that means expansion in DP. This organization needs Programmer with at least 1 year of UNIX, COBOL, and BASIC to maintain, enhance and develop [illegible] applications. Excellent opportunity to get more visibility and responsibility. Salary to $30,000.

[illegible]

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St. Louis, MO 63105
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Openings at all levels in any of the above. Call Maggie Lipton, 212-[illegible] or submit resume to Interface Inc., 17 West 54 St. NY, NY 10019.

SYSTEMS PROGRAMMER

To maintain, update and install systems software, troubleshoot hardware and software problems, regulate and manage resource usage. CICS heavily emphasized, DOS/VSE or ICCF helpful. COBOL background preferred. Experience in system development and Bachelor's degree required. Mail letter and resume to be received by August 12, 1985 to Somerset County College, Personnel Office, P.O. Box 3300-C, Somerville, NJ 08876.

Affirmative Action/ Equal Opportunity Employer.

PROGRAMMER/INFORMATION ANALYST: Write applications programs pertaining to statistical applics & data organization & maintenance. Hardware primarily IBM 3033. Requirements: 2 yrs. exp., COBOL, OS/MVS, WYLBUR, DATATEXT, TSO, SAS, SPSS. $27,500/yr 40 hrs/5 days/wk. Mail resume to NYS Job Service JO#8007084. 175 Remsen St. B'klyn, NY 11201. DOT 020167010.

HP-3000

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DUNHILL OF ALBUQUERQUE INC
3717 Louisiana NE, Suite [illegible]
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[illegible]
Exclusively Employer Retained

Data Processing Manager

S.S. Pierce Company, a wholesale distributor in the Boston area seeks an individual with a minimum of 5 years supervisory experience to manage its facility. The candidate will be responsible for all functions on an NCR-[illegible], including systems, programming and operations, as well as the supervision of 25 staff. Ideal candidate will have programming experience preferably in COBOL. Please send resume with salary history to: S.S. Pierce Co., Centennial Industrial Park, P.O. Box [illegible], Peabody, MA 01960. ATTN: D.P.32.

Data Processing

OPPORTUNITIES IN AN ADVANCED TECHNOLOGICAL ENVIRONMENT

First Atlanta Corporation, a major Southeastern financial institution, continues to expand and excel. This growth has created career opportunities.

DEVELOPMENT CENTER

Exciting opportunities exist for highly motivated Systems Analysts to influence the programming environment through the review and recommendation of new technology designed to increase programmer productivity. As part of the Systems Development area, this team coordinates all testing and serves as a liaison with operations/technical support.

The following qualifications are required:

- BS in Computer Science or equivalent experience
- 3+ years large-scale IBM background as a Programmer Analyst or Systems Analyst
- OS/JCL • COBOL • TSO/SPF
- Excellent oral and written communication skills
- Experience evaluating programmer productivity tools is preferred.

First Atlanta offers an attractive salary/benefits package, commensurate with skills and experience. For consideration, call (404) 231-6639 or forward resume with salary requirements to: **FIRST ATLANTA CORPORATION, J. Cousin, Technical Recruiter, 2400 Piedmont Rd., Mail Code 2341, Atlanta, GA 30324.**

The First National Bank of Atlanta **FIRSTATLANTA**

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DATA PROCESSING CONSULTING MANAGERS

Rapid expansion of our Management Consulting Services practice has created the immediate need for experienced consultants to our Pittsburgh Office. Qualified candidates will be entrepreneurial with a minimum of 5 years of leading edge experience in data processing which should include:

- Communications
- Data Base
- Fourth Generation Language
- Networking

Experience in large scale systems implementations is highly desirable. Candidates must possess excellent oral and written communication skills. An advanced degree is preferable.

As a large and dynamic professional organization, we offer outstanding opportunity for rapid advancement with a competitive salary and fringe benefit package. Interested individuals should send resume and salary history in strictest confidence to: Daniel T. Keegan, Partner in Charge, Management Consulting Services Department.

NAS Confidential Reply Service
Department [illegible]
Suite [illegible], 3 Gateway Center
Pittsburgh, PA 15222

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MANUFACTURING SYSTEMS

Project Manager

High visibility and excellent career potential await the results-oriented specialist who can manage implementation of a challenging MRP II project. This growing Eastern Tennessee-based division of a dynamic Fortune 500 corporation offers an immediate opportunity to a talented Manufacturing Systems Professional whose background includes:

- MRP II implementation experience (Xerox software knowledge a plus)
- IBM 43XX Data Center Start-up
- Proven leadership and Project Management experience

We offer outstanding potential coupled with an excellent compensation package. For immediate consideration send resume to:

Ms. Carol King
1200 Equitable Bldg.
Atlanta, GA 30043

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Services offered only to degreed U.S. citizens and permanent residents with two years minimum professional-work experience (or PhD). Send resume or rough notes of job objective, current and desired salary, location restrictions, education and experience (including computers, models, operating systems, languages and special software) to either one of our locations. Or call toll free from outside NJ 800-222-0153 or from within NJ 609-667-4488 or 201-528-9630

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Cherry Hill, New Jersey 08002

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Blue Bell, Pennsylvania 19422

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Employment Agents for Computer Professionals

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But New Orleans is much more than a great place to live, it's a great place to further your Data Processing career. New Orleans is the home of MIDDLE SOUTH SERVICES, INC., the service arm of the Middle South Utility System.

MIDDLE SOUTH SERVICES is currently involved in several projects including large scale IMS DB/DC systems development. The current hardware environment consist of (2) IBM 3084's, MVS/XA, 4381 VM, and Tandem.

Openings currently exist in the following groups:

APPLICATIONS DEVELOPMENT
TECHNICAL SUPPORT
DATA ADMINISTRATION

If you would like additional information about the career opportunities at Middle South Services, call Joe Hebert or Byron Heath or send Resume to:

Middle South Services
P.O. Box 61000
New Orleans, LA 70161
1-800-231-4481

MIDDLE SOUTH SERVICES INC.
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EDP SYSTEMS PROGRAMMERS

Saudi Arabia

Saudi Consolidated Electric Company (SCECO) is responsible for the generation, transmission and distribution of power in the Eastern Province of Saudi Arabia. There currently exists a need for qualified EDP Systems Programmers with experience in electric utilities.

Positions require a Bachelor's degree in Computer Science, Physical Science, Engineering or Math; 6 years related experience with 2-4 of those years in installation and program support of CICS/VS under MVS. Installation and maintenance of MVS/SP or MVS/XA operating systems also necessary as well as in-depth knowledge of CICS, DL1 internals and externals. Familiarity with IBM mainframes or equivalent essential.

A competitive salary and liberal vacation/travel benefits are offered. For consideration, please submit resume to SCECO. Representatives at:

TRI

TECHNICAL RESOURCES, INC.
3250 Wilshire Blvd.
Suite S-344
Los Angeles, CA 90010

JOIN PRATT & WHITNEY IN FLORIDA

PRATT & WHITNEY is seeking individuals with a degree in Computer Science or related area and 2-5 years experience with COBOL, IBM, JCL, MVS, TSO, SPF, VSAM, IDMS, SAS, IMS DB/DC on large IBM main frames in the following areas:

- **Engineering Business Applications**
- **Bill of Material/Part Number Experience**
- **Systems Programming (DASD Mgmt, Info/Mgmt)**

The opportunities we offer combined with our excellent South Florida climate and superb recreational facilities are unbeatable — our employees love it here — so will you.

Please send your resume to Professional Placement, Department CW, Box 2691, West Palm Beach, FL 33402.

UNITED TECHNOLOGIES PRATT & WHITNEY

An Equal Opportunity Employer/U.S. Citizenship Required.

- Systems Programmer to $37K
- Programmer/Analyst to $37K

We are looking for individuals with a strong technical background on the IBM System 36, who are interested in a dynamic environment of multiple S/36s operating within a APPC network.

Basic requirements are two or more years of S/36 experience, knowledge of S/36 hardware, and good problem determination skills. Strong 4300 programmers also considered. RPG III a plus.

If you are interested in our excellent benefits package, growth potential, and work environment, submit your resume for confidential consideration to:

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PROGRAMMING & SYSTEMS ANALYSIS OPPORTUNITIES

Toledo Edison is seeking candidates for several immediate openings at our Corporate Headquarters located in Toledo, Ohio.

Candidates should have minimum of an Associate's Degree and four (4) years experience or a Bachelor's Degree and two (2) years experience in systems analysis and/or programming work on large mainframe computers. Working knowledge of on-line systems using IMS or CICS is a plus. Knowledge of IBM OS/JCL or DOS necessary.

Previous work experience in accounting, material inventory, order entry systems, information center activities, project leadership, technical systems design, program design and programming standards desirable.

We offer competitive salaries as well as a complete benefit package including medical, dental, optical and prescription coverage, life insurance, savings incentive plan, educational assistance, pension plan and excellent relocation package.

Send confidential resume and salary history or CALL: (419) 249-5384 or 249-5831 for further information.

TOLEDO EDISON

Rebecca Byerly
Human Resource Dept. 85-36
300 Madison Avenue
Toledo, Ohio 43652

An Equal Opportunity Employer

DP Professionals

Revolutionizing an industry

Sea-Land Corporation was the first transportation company to understand the potential of a standardized container that could travel from sea-to road-to rail. In less than 3 decades, we have driven this idea to a $1.8 billion success worldwide and revolutionized the shipping business. And we won't stop there - we're at work pioneering the optimum utilization of information systems.

We have openings at all levels for creative professionals as well as CICS Programmer Analysts with a minimum of 1 year's experience who have the kind of vision it takes to see a different future.

MVS/XA

We require a minimum of 1 year's experience; solid installation knowledge using SMP4 or SMP/E; strong MVS internals, VTAM or TCAM experience a plus.

CICS

We require a minimum of 1 year's experience; CICS tables & definitions and internals which will call on your knowledge of either MVS/XA, TCAM, VTAM or CICS.

Network Communications

A minimum of 1 year's experience with TCAM or VTAM/NCP, installing and maintaining SNA program products and good networking ability are necessary.

Disaster Recovery Analyst

A minimum of 2 year's experience in DASD management and systems support. Strong JCL skills and a knowledge of SAS using DMS/OS and FDR or DFDSS are essential.

The salaries are attractive and the benefits complete. Our location is convenient to major highways and less than ½ hour from the heart of NYC and minutes away from Newark Airport.

Send resume, with salary history, to: Manager, Personnel Department CW, PO Box 1050, Elizabeth, NJ 07207 or call for immediate consideration:

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Sea-Land Corporation

OEM ACCOUNT MANAGER

CalComp, the world leader in the computer graphics marketplace, is introducing a series of state-of-the-art computer graphics workstations and displays. These products represent a broad product line of powerful, multi-processor distributed processing, highly-intelligent workstations competitively priced for the OEM marketplace. We have openings in our Houston, Anaheim, Santa Clara, CA, and Waltham, MA offices.

The selected candidates for these growth opportunities will be responsible for the sales of these products to Fortune 500 and leading computer graphics corporations as a member of CalComp's Strategic Accounts/OEM Marketing team.

The requirements for the successful candidates are a B.S. degree in Business or Marketing and/or a BSEE (or equivalent) plus five years recent experience with exceptional performance in direct selling to OEM's of Engineering workstations, super mini's or related graphics displays.

If your motivation is to associate with a high growth corporation that offers excellent career development opportunities, you should send your resume to:

Mike Leslie
CalComp
2411 W. La Palma
P.O. Box 3250
Anaheim, CA 92803

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The Computer Graphics People

[illegible]

P/A-ASST MANAGER
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Excellent opty within trading industry for the go-getter professional. Programmer analyst functions as well as Asst Manager respons. DATA GENERAL AOS COBOL/BASIC exp. Must be familiar with all phases of operations.

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OF NEW YORK, INC.
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New York, N.Y. 10036
212-221-6400 (agency)

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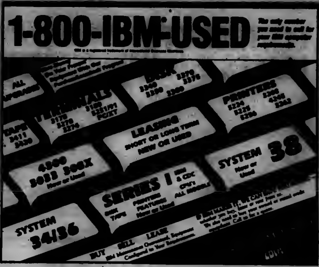

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OTP 84-85-01

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The Proposals will be received at the Commission's offices, 682 Prospect Street, Berea, Ohio 44017 until 10:00 a.m. (E.D.S.T.), September 25, 1985.

Plans and specifications for said Request for Proposals, including a form of affidavit to accompany any such Proposal, are on file and available at the office of the Commission's Director of Operations. These documents will be forwarded upon request and without charge to any interested party.

The Commission expects to retain its existing equipment, except entrance and exit terminals for use in collector-attended lanes, automatic ticket-issuing machines, toll ticket units and ticket certifiers. Any equipment furnished must be integrated and interfaced with existing lane equipment. Such new equipment must be consistent with system such capability, and must provide state-of-the-art enhancement of existing functions.

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ADVERTISERS INDEX

ADR	3
Aluminum Case Company	25
Arista Data	10
AT&T Information Systems	38-39,52-56
BDS Corp.	9
Codex Corp.	35
Computer Associates	22
Computer Management Research	34
Control Data Corp.	58-59
Cullinet	41-43
CW China	72
CW Circulation	61
CW Focus	73
CW Japan	44
CW Micro Extra!	46
CW Spain	66
CW Special Report	77
Duquesne Systems, Inc.	23
Dynatech Computer Power, Inc.	60
EPS, Inc.	36
Execucom Systems Corp.	76
Fusion Products	40
Gimcrax, Inc.	31
H & W Computer Systems	11
Honeywell Information Systems	27-29
IBM	45,62-63
Infotron Systems	64
Innovation Data Processing	7
ITT Courier	20-21
ITT Information Systems	47
Leasametric	65
McCormack & Dodge	96
MCRB Software	10
Michaels, Ross & Cole	60
NCR Comten	30
Nestar	37
Netec	24
Northern Telecom	67-69
Novell, Inc.	34
Oracle Corp.	15
Pan Pacific Conference	26
Realia Inc.	13
SAS Institute	17,48-49
Softool Corp.	66
SofTouch Systems	51
Sperry Corp.	50
Syncsort	5
Tandem Computers	74-75
Telegenix, Inc.	25
Texas Instruments	70
Tone Software Corp.	31
UCCEL Corp.	40
Westwood Computer	70
Xerox Corp.	32-33

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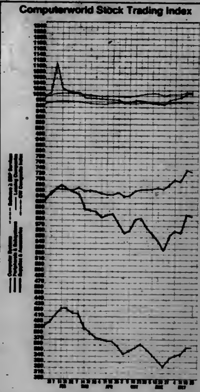

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